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Editor—HENRY E. SIGERIST

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Editor—HENRY E. SIGERIST

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FROM BISMARCK TO BEVERIDGE

DEVELOPMENTS AND TRENDS IN SOCIAL SECURITY LEGISLATION

HENRY E. SIGERIST

Introduction

The Second World War following logically a protracted period of world economic depression has given increased significance to the problem of social security. The many millions of working men and farmers serving in the armed forces of every country and the millions of workers engaged in vital industries are justified in asking what their future will be if they survive the war. Will it be a return to the misery of unemployment, to the dole, the means-test and ill-payed relief work? Or, having accepted the duty to work, will they have the right to work and through their labor to acquire security for themselves and their families? Will they be able to obtain security while preserving and improving their democratic institutions, or will the price for it be the acceptance of tyranny?

Basic issues can be dodged in a short war but not in a long one like that in which we are engaged. Social security is the major domestic war aim of every country that has not yet solved the problem. But it has far more than domestic significance: the very issue of the war may depend on its solution, because it is not machines that win battles but the spirit and determination of the men who make and handle them.

Social security is implicitly included in the Atlantic Charter. "Freedom from Want" will remain an empty promise unless concrete steps are taken now for its realization. It is a great fallacy to believe that this is a post-war issue that can wait until the war has been won. It is as urgent today as the production of airplanes and tanks. With every war people will become more restless and will more strongly resent promises that are not kept. If we have not the intelligence and courage to plan for the future now and make the adjustments that our industrial society requires, the people will take their destinies into their own hands.

Aware of the situation, the British government on June 10, 1941 requested Sir William Beveridge "to undertake, with special reference to interrelation of the schemes, a survey of the existing national schemes of social insurance and allied services, including workmen's compensation, and to make recommendations." After eighteen months of intensive work, on November 20, 1942, Sir William submitted his report. His recommendations probably far exceeded what the government had expected.

In the United States a few months later, in March 1943, President Roosevelt sent to Congress a report on *Security, Work and Relief Policies* which had been prepared after three years' labor by the National Resources Planning Board.

The significance of these two documents cannot be estimated highly enough. They are the most important documents that have come from this war. The Atlantic Charter is a vague program, a promise, a hope at best, while these documents pave the way for legislative action and make it possible to put some of the points of the Charter into practice. Not only the British Parliament and the United States Congress will have to discuss these plans at length, but every responsible citizen in the two countries must make up his mind in regard to them. They should be made the subject of debates in schools, factories, farms and clubs, and everyone should realize that the immediate future is at stake.

Both documents are long and highly technical. They must be so because plans are worthless unless they are built upon the solid foundation of facts and figures. But to the average citizen, and even to the one who has political education, they are bewildering because

the issue is so big and because the forces that are at play are not always apparent.

We must be aware of the fact that both plans do not in any way represent novel departures. They are by no means revolutionary, but take merely one more step in a development that began sixty years ago. It seems to me, therefore, that a historical analysis of this development and of the trends involved may help us in clarifying our thought.

It is strange that the history of so significant an aspect of Western civilization has not been written exhaustively as yet. We, of course, possess a great number of excellent books that discuss the social insurance systems of various countries, but we still lack an adequate historical presentation.

The series of short articles that I am beginning today cannot possibly fill the gap, but I hope that they will stimulate further research in the field. Their purpose is not to discuss technicalities of social insurance, but rather to analyze the economic, social, and political forces which at a given moment of history prevailed in a given country and led to the enactment of social security legislation. History does repeat itself, every day, under our very eyes—and we can learn a great deal from it.

I.

THE PERIOD OF BISMARCK

We must begin with Germany because the pioneering step in social security legislation was taken in that country. Bismarck was the driving spirit who against great opposition created the first comprehensive social insurance system and thus initiated a movement which rapidly spread from one country to another.

Social insurance is a result of the industrialization of the world. In the feudal society of the Middle Ages, the economically weak individual was the responsibility of his lord or was an object of charity. The idea of mutual insurance took root with the disintegration of feudalism. In the late Middle Ages already craftsmen's guilds organized mutual benefit funds; the miners, somewhat later, formed brotherhoods that served a similar purpose. When the guilds lost their political power, they nevertheless preserved in many cases their welfare institutions.

The development of capitalism greatly increased the insecurity of the working class, and the situation became very acute in the 19th century after the Industrial Revolution. Millions of people depended on the labor market for a living. Working long hours on wages too low to permit savings, exposed to many hazards, they were thrown out of work by accidents, disease, old age, and by the periodic economic crises that are inherent in capitalist production. Without reserves from which to draw, they became public charges, recipients of a charity that was unable to cope with a problem of such magnitude.

Following the example of the artisans, the industrial workers organized mutual aid societies. They were voluntary, reached only relatively small groups, and were not strong enough to protect their members sufficiently. It is no wonder that the working class became dissatisfied with a system that took so much from them and gave them so little in exchange, not even a minimum amount of security. On the other hand, it was not in the interest of society to carry along masses of disabled indigents. In every country the moment came when some sort of a solution had to be found.

1.

Bismarck did not create his social insurance scheme from a void.[1] He built on the basis of the already existing institutions [2] and also—unconsciously—drew from the ideas of the revolution of 1848 which he so deeply abhorred.

Before Bismarck's legislation, the protection of working people in Germany was provided from three different sources. One of them was the employer's liability for compensation in case of accidents. It was based on an old concept of Roman law but was in most cases illusory because the employee had to sue for damages and had to prove in court that the injury was due to negligence or the fault of the employer.

In 1838 the first railroad line was built in Prussia, from Berlin to Potsdam. The same year a law was passed that made railroad companies liable for accidents and compelled them to compensate injured persons, employees and passengers, unless the company could prove that an accident was caused by negligence of the victim or by an "act of God." After the unification of Germany, an imperial statute enacted in 1871 extended the same liability to other industrial undertakings such as mines, quarries, and factories.

The law required shipowners to provide sustenance and medical care to diseased sailors irrespective of negligence, except in the case of illicit action and venereal infection. Commercial employees were entitled by law to six weeks' wages if they were disabled without their fault, but the employer could waive such obligation by contract. Domestic servants had to be given medical attention in case of illness, and the cost could be deducted from their wages by the employer.

[1] The literature on Bismarck is endless. Most important are the collections of documents edited by H. von Poschinger, *Fürst Bismarck als Volkswirt*, 3 vol., Berlin, 1889-1891; *Aktenstücke zur Wirtschaftspolitik des Fürsten Bismarck*, 2 vol., Berlin, 1890-1891; *Fürst Bismarck und die Parlamentarier*, 3 vol., Breslau, 1894-1895; *Fürst Bismarck und der Bundesrat* (1867-1890), 5 vol., Stuttgart and Leipzig, 1896-1901. See also Arthur Böhtlingk, *Bismarck als Nationalökonom und Sozialpolitiker*, Leipzig, n. d.

[2] Lujo Brentano, *Die Arbeiterversicherung gemäss der heutigen Wirtschaftsordnung*, Leipzig, 1879.—Ernst Hunkel, *Fürst Bismarck und die Arbeiterversicherung*, Thesis, Erlangen, 1909.—Alfred Manes, *Sozialversicherung*, Berlin and Leipzig, 1926.

These were all legal regulations which imposed definite duties upon the employers. Welfare institutions of a totally different kind were the mutual benefit societies, organized by the wage earners themselves in the German states just as in England, the United States and other countries. In Germany, however, these organizations developed along a different line. We already mentioned the miners' brotherhoods. They provided sickness, disability and funeral benefits, and pensions to widows. For centuries they were voluntary organizations, but a Prussian statute of 1854 made membership in such a benefit society compulsory. Contributions amounted to a percentage of the wages and were deducted by the employer who himself had to contribute an amount equal to at least one half of the sum paid in by the workers. The funds were administered jointly by employers and employees.

Journeymen had similar mutual benefit societies, and a statute of 1845 empowered communities to require membership in such a society from all journeymen domiciled in the place. In 1849 communities were further entitled to urge employers to join these societies and to contribute up to one half of the amounts paid in, and at the same time the regulations were extended to factory workers. In 1854 the districts were given the power to enforce the organization of benefit societies and to set dues in case the communities failed to do so.

In other words: the idea of compulsory insurance was accepted in Germany long before Bismarck, although it was applied only in a very limited way.

Another group of welfare measures was vested in the State, namely poor relief. It was delegated to the communities whose obligation it was to provide sustenance, medical care and a funeral to citizens unable to support themselves or to be supported by other individuals. Poor relief was a matter of public charity to which no one had a legal right, and the recipient of relief was deprived of his civic rights.

In Bavaria, Baden, and Württemberg, communities were authorized from 1869 on to establish public sickness insurance funds, membership in which could be made compulsory for all unmarried wage earners who were not living with their parents.

The revolution of 1848 in Germany was a movement of the liberal middle class. The country was in the birth-pains of industrialization. Mining, the metallurgical industries and transportation were undergoing a rapidly increasing development, creating wealth for a few and misery for many. The liberal movement that sprang up in the years preceding the revolution was directed against feudal privileges and clerical obscurantism, and fought for a union of the German states, for parliamentary government, and for the improvement of social conditions.

Physicians took a leading part in the movement.[3] They were fully aware of the health hazards created by the new economic order and were convinced that the problems could not be solved without a thorough reform of medical services. They postulated the people's right to health and the duty of the state to protect health "as its most precious property." They called for vastly improved public medical services for the indigents, for an increase in hospital facilities whereby the hospital was to become the center of medical practice. At that early time voices were already raised to ask for compensation for the loss of wages due to illness and to demand sickness insurance financed by contributions from the workers and from the propertied classes with municipal and state subsidies.

The revolution failed and was followed by a period of dark reaction, but the ideas that had been formulated could not be killed since they were the result of a powerful economic development that could not be undone.

Thus the stage was set for Bismarck's plans of social insurance, and we must now analyze the political forces that were at play and made it possible for the plans to be put into practice.

2.

In 1862 Bismarck became Prime Minister of Prussia. The aim of his policy was to mould the thirty odd German states into a strong empire under the leadership of the Prussian monarchy. This required first that Austria be driven out of Germany. In 1866 Austria and

[3] Erwin H. Ackerknecht, Beiträge zur Geschichte der Medizinalreform von 1848, *Sudhoff's Archiv für Geschichte der Medizin*, 1932, vol. 25, pp. 61-109, 113-183.

her South German allies were defeated in a war that lasted only a few weeks. The ties between the German states and the Habsburg monarchy were cut, and the North German Confederation was established in 1867 with a parliament (*Reichstag*), elected by universal, equal, secret, and direct suffrage, and a federal council (*Bundesrat*) in which the governments of the constituent states were represented.[4] At the same time an alliance was made with the South German states.

In the war of 1870-1871, France, the strongest power on the European continent, was defeated, and in January 1871 the German empire was founded in Versailles. The King of Prussia, William I, became Emperor of Germany with Bismarck his Chancellor. The Constitution of the Empire followed closely that of the North German Confederation.

Bismarck had been playing a hazardous game, but his political acumen backed by the powerful Prussian army had won. He had succeeded in creating a united nation under Prussian leadership, and the country freed from all interstate barriers was ready to develop into the strongest industrial power of the continent.

In the years immediately following the war capital was easily available. France had paid an indemnity of five billion francs, an enormous amount in those days, much of which was invested in new industries, mines, factories, and railroads. Money was cheap and prices therefore high. The workers struck for higher wages. The industrialists and farmers called for protective tariffs, a measure that was opposed by the working class since it would raise prices on the domestic market. Social unrest increased when after a short period of post-war boom, an economic crisis developed at the end of 1874 which led into a long period of depression. The time was ripe for social legislation.

Bismarck was a member of the Prussian landed aristocracy. He was a feudal landowner who disliked the large cities and still more the bankers and industrialists. He felt ill at ease in the world of ruthless competition that developed around him. He and his friends of the Conservative Party had the feudal paternalistic attitude toward poverty. They thought that it was the duty of the lord to help the

[4] Prussia had 17, the other states together had 26 voices. The members of the Bundesrat were not elected but delegated by their governments and voted by instruction.

poor, and since protestantism was part of their philosophical and political equipment, they called it the Christian attitude. They identified themselves with the state—the monarch was one of their class—and therefore were in favor of having the state power used to provide social security to the economically weak. Their representation in the *Reichstag* was not large,[5] but they had great influence nevertheless because they controlled the court and the army.

The Liberals were by far the largest parliamentary group. They were very different from the Liberals of 1848 as a result of the economic development that Germany had undergone in thirty years' time. They represented the middle class and therefore the interests of finance, industry, and commerce. They were ready to call on the state when they needed tariff protection, but otherwise advocated the policy of *laisser faire, laisser aller*. In the teeth of economic depression they had the nerve to claim that industry could provide employment and prosperity for all if the government did not interfere with the normal play of economic forces. They were the most violent opponents of Bismarck's legislation.

An intermediary position full of contradictions was held by the Catholic party of the Center, in which Bavaria and the Rhineland were strongly represented. Philosophically the party was conservative, and in its mediaevalism had much in common with the Conservative Party. But it was anti-Prussian, and Bismarck tried to crush it in the so-called *Kulturkampf*, the struggle between the state and the Catholic Church that raged in the eighteen seventies and in which Bismarck was defeated. Then, after he had given in, the Center supported his social legislation. Strongly opportunistic, the Center took good advantage of its position between the conservatives and liberals, and although it rarely had more than 100 members in the *Reichstag*, it always managed to play an important rôle.

The third political force was represented by the Social-democratic Party.[6] A young party, small, with few members in parliament but with brilliant minds, men like Bebel and Liebknecht, it was an articu-

[5] They had 54 of 382 seats in 1871, 21 of 397 in 1874, and 80 of 397 in 1887. The German *Reichstag* began with 12 political parties represented in 1871 and ended with 12 parties in 1932. It had 15 parties represented in 1930.

[6] See Franz Mehring, *Geschichte der deutschen Sozialdemokratie*, Stuttgart, 1897-1898, 2 vol.

late and conspicuous group because it was a revolutionary party whose political philosophy was opposed to that of all other groups. It represented the industrial workers and had tremendous potentialities at a time when industries were growing like mushrooms. In the elections of 1871 the socialists won only 1 seat, but they had 9 in 1874, 12 in 1877, and it seemed likely that they would continue to grow if nothing stopped them.

In Germany we find the rather unusual situation that trade-unionism did not precede but followed the organization of socialist workers' associations. Trade unions are never very radical because they have an immediate day-by-day task to fulfill. Their goal is not to change the social order, but rather through collective bargaining and strikes, if necessary, to win immediate gains for improving the condition of the laboring class. In many countries, therefore, the trade unions acted as a brake rather than a stimulus to the socialist movement.

This was not the case in Germany where trade unions did not come into existence before 1868 while there was a great deal of socialist agitation among the workers of Saxony and the Rhineland in 1848-1849, and Lassalle founded the Universal German Workingmen's Association (*Allgemeiner Deutscher Arbeiterverband*) in 1863. It was a socialist party but was mild enough because it still had to fight for such elementary rights as universal suffrage. In 1869, however, Bebel and Liebknecht, both followers of Marx, founded the Social-democratic Workingmen's Party (*Sozialdemokratische Arbeiterpartei*) which was affiliated with the First International and in 1875 absorbed Lassalle's group. It was from the beginning a revolutionary party that did not compromise with the government.

It may be mentioned in this connection that Germany from 1849 on had a rapidly developing cooperative movement, the leaders of which were Schulze-Delitzsch and Raiffeisen. The movement, however, had no connection with socialism, was not in any way popular with the laborers and appealed primarily to the low middle class and small farmers.

From 1875 on the Social-democratic Party was the only group that represented the industrial workers of Germany. Its membership was increasing from year to year. Bismarck was fully aware of the

menace it presented to his regime and decided to destroy it before it became too strong. The Paris Commune of 1871, in spite of its swift collapse, had demonstrated that socialism was not a dream of philosophers but might become a tangible reality.

The opportunity to strike that Bismarck had been seeking came suddenly when in May 1878 a shot was fired at the old Emperor by an irresponsible, completely unbalanced individual who once had been a member of the Social-democratic Party but had been expelled from it. Without delay Bismarck brought an act before the *Reichstag* which virtually outlawed all organizations that had any socialist tendency. It was defeated by the votes of the Liberals who were not anxious to see a police regime established, but at this very moment, in June, a second attempt was made on the Emperor's life and this time he was seriously wounded. The man who perpetrated the crime committed suicide on the spot, and it made no difference that he was not a socialist and had no connections with the Social-democratic Party: Bismarck was determined not to let this second opportunity pass by, and at the same time he wanted to strike a blow at his Liberal opponents. He dissolved the *Reichstag*.

The elections took place in an atmosphere of tremendous excitement, of repression, and " white terror." The workers stuck to their guns. In Berlin they almost doubled their vote, and nationally they lost only 3 of their 12 seats. The chief sufferers were the Liberals who lost about 40 seats to the Conservatives.

In October this new *Reichstag* passed the Socialists Act, which deprived all socialist groups of freedom of assembly, freedom of the press, and practically strangled all their activities. It was enacted for a period of two and a half years, was reenacted several times and was in force until 1890, the year of Bismarck's retirement.

Bismarck had won, or at least it looked as if he had won. He had failed in his conflict with the Catholic Church, but he had succeeded in smashing the socialist organizations of the country. He was much too clever a statesman, however, to believe that a strong popular movement could be simply suppressed by parliamentary acts and police regulations, by violence and terror. He realized that the workers of Germany had good reasons for being opposed to the government and for seeking a different social order. He clearly

saw that one of their major grievances was the insecurity in which they found themselves in an economy that produced in fits, in periods of boom and depression, and was unable to guarantee steady employment. The specter of unemployment haunted them constantly. Not only economic crises but disease and accidents were permanent threats. They disabled a man and made him unemployable, temporarily or permanently. And old age was always looming, with no savings upon which to rely, making a man a burden to his relatives, or after a long life's laboring a recipient of degrading public charity. It was no wonder that people were struggling for an economy that would give them not only the duty but the right to work, and that would entitle them to security.

Bismarck set out to give the people this security, and in so doing he expected to take the wind out of the sails of the socialist movement and to destroy it even more effectively than by the Socialists Act.

3.

As early as 1849 Bismarck in an address said: "The social insecurity of the worker is the real cause of their being a peril to the state." [7] And in 1871 in a letter to the Minister of Commerce, Count Itzenplitz, he pointed out that the only way to stop the socialist movement in its present aberration was by fulfilling the socialist claims so far as they seemed justified and so far as it could be done within the framework of the existing political and social organization.[8]

What Bismarck had in mind was a centralized and unified system of insurance that would protect all economically weak groups including agricultural workers from major risks by providing compensation and services. It was to be financed by contributions of employers and employees, and by government subsidies. Government charity was to become a government subsidy. The various occupational groups would be organized into corporations which would administer the insurance system.

It was obvious that such a far-reaching scheme would not be

[7] Rede im Vereinigten Landtag vom 18. Oktober 1849.

[8] H. von Poschinger, *Aktenstücke zur Wirtschaftspolitik des Fürsten Bismarck*, Berlin, 1890-1891, vol. I, p. 164.

accepted by the *Reichstag* immediately, and Bismarck was well aware that he would have to introduce it gradually. Since the protection against the risk of accidents was the most urgent task, it was logical to begin with *Industrial Accident Insurance.*[9]

The first bill was brought before the *Bundesrat* on January 15, 1881 and was referred to the *Reichstag* on March 8. It provided compulsory insurance for all industrial employees earning not more than 2000 marks a year. Two-thirds of the premium were to be contributed by the employers, one-third by the state in the case of workers earning 750 marks or less, while one-third was to be contributed by workers earning from 750 to 1000 marks. If annual wages amounted to from 1000 to 2000 marks, the premiums were to be contributed in an equal amount by employers and employees. Benefits provided the costs of treatment and compensation, beginning with the fifth week, whereby the idea was that the existing mutual benefit societies should contribute for the first four weeks. In other words, the system protected the worker only in case of serious accident. If an accident resulted in death, the fund provided the cost of burial and an annuity to the widow amounting to 20 per cent. of wages plus 15 per cent. for every child under 15 years of age.

The insurance was to be vested in a special government bank, and Bismarck justified this by saying that private insurance companies were too expensive since they had to earn dividends and that they, moreover, were not safe enough.

The bill had the support of the Conservatives but was defeated by the vote of the Liberals. Since they represented the interests of the private insurance companies, they were opposed to having the insurance vested in a non-profit government institution and also rejected the plan of a government subsidy. They were in principle against government interference except, of course, when it served their own immediate interests.

The Social-democrats also opposed the bill. How could they have confidence in the policy of a man who had just outlawed their organizations and was determined to destroy them altogether? They

[9] The early literature is listed and discussed in: A. von Miaskowsky, Zur Geschichte und Literatur des Arbeiterversicherungswesens in Deutschland, *Jahrbücher für Nationalökonomie und Statistik*, Neue Folge, vol. IV, 1882, pp. 474-496.

had no objection to the idea of a centralized insurance fund but were not in favor of government subsidies. They held the view that the cost of accident insurance must be considered part of the cost of production, that premiums therefore should be contributed by the employers alone, and that subsidies would amount to a straight gift from the government to industry.

Thus Bismarck's first attempt ended in defeat, but he did not give in. Elections were pending and social insurance was the major issue. Bismarck combined it with the plan of a tobacco monopoly which was to provide the funds required for the government subsidy. The elections turned entirely against Bismarck. In spite of the Socialists Act that deprived the workers of the freedoms of assembly and press, they increased their vote and gained three mandates so that they again had 12 seats. The two conservative parties lost 48 seats to the Liberals.

But Bismarck was stubborn and used every means of pressure to put his policy through. When the *Reichstag* convened on November 17, 1881, it was opened with a Message from the Throne—drafted by Bismarck—in which the old Emperor emphasized the importance of social legislation and documented his solidarity with the policy of his Chancellor. The Message said among other things:

> In February of this year we have already expressed our conviction that the healing of the social evils cannot be sought in the repression of social-democratic excesses exclusively but must equally be sought in the positive promotion of the workers' welfare. We consider it our duty as Emperor to recommend this task again warmly to the Reichstag. With all the greater satisfaction would we look back to all the success with which God has so apparently blessed our Reign, if we succeeded, when the time comes, in carrying along the knowledge that we have left to the fatherland new and lasting guarantees for its internal peace, and to the needy more security and a larger volume of the assistance to which they are entitled. In our efforts tending in this direction we can count on the agreement of all allied governments and we have confidence that the Reichstag will lend its support irrespective of party lines.
>
> To this end the draft bill on workers' insurance against industrial accidents presented in the previous session by the allied governments is now being revised in accordance with the debates held on the subject in the Reichstag, so as to prepare for its renewed discussion. A supplementary bill will be presented with it which has for its purpose the uniform organization of

industrial sickness insurance. But those people who become unemployable on account of age and invalidity also have a well founded claim on the community to a higher measure of state assistance than was granted to them in the past.

To find the right ways and means for such assistance is a difficult, but also one of the highest, tasks of every community that builds on the ethical foundation of Christian social life. The closer approach to the real forces of this social life and their integration in the form of cooperative associations [10] under state protection and with state support will, so we hope, permit also the solution of tasks which the state power alone could not master in equal measure. But even in such a way it will not be possible to reach the goal without the appropriation of considerable funds.

The language of this Message was unmistakably clear. Through the Emperor's voice Bismarck announced that he wished to obtain not only an accident insurance, but a system of insurances that would cover the workers against all major risks.

As a first step Bismarck decided to supplement the Accident Insurance Act with a *Sickness Insurance Act* and to bring the two bills before the *Reichstag* during the same legislative period. It took some time to draft and revise the bills since additional statistical information had to be gathered. The Liberals meanwhile made a last attempt to prevent social insurance legislation by introducing a bill for the extension of the Employers' Liability Act. It was endorsed by 144 liberal deputies, but the time was too advanced and the bill died in the committee stage.

Bismarck's two bills were whipped through the *Bundesrat* within a few weeks and came before the *Reichstag* in the spring of 1882. His sole endeavor, at the moment, was to get some legislative action so that the ball would start rolling, and since he could count only on conservative support, he was prepared to make and, as a matter of fact, had already made far-reaching concessions. He felt that, once he had a bill passed, he would be able to improve it gradually through amendments.

The debates were long and arduous. The Liberals fought for the preservation of the sacred principles of individualism and *laisser faire,* and called Bismarck a socialist—Bismarck who was out to destroy the socialist movement.

[10] Korporative Genossenschaften.

The Social-democrats opposed the bills for other reasons. They pointed out that the highly advertized "social reform" was actually nothing but organized poor relief. They spoke of a "beggars' insurance," one that would merely prevent the worker from becoming a beggar, while making him pay for what he received. They further pointed out that the bills did not solve any problem of the laboring class, that they did not attack the causes of misery but only their results, and that they represented only an attempt to bribe the workers into complacency. The Social-democrats made a number of constructive suggestions. They wanted not only compensation for industrial accidents but prevention, by having strict factory laws and factory inspection. They were not opposed to compulsory sickness insurance and were willing to have the employees contribute the entire costs, provided the funds remained under workers' control. They realized that they would lose control over the mutual benefit funds established by the trade unions as soon as the employers were required to make contributions.

After debates of over one year the Sickness Insurance Act, being much less controversial, was passed and became the law on June 15, 1883. Bismarck, of course, would have liked to have a uniform, centralized sickness insurance organization. Realizing that such a scheme would never obtain a parliamentary majority, he compromised and the bill permitted that use be made of the infinite variety of existing private sickness benefit societies. The only conditions were that these funds would provide minimum benefits set by law, that they would present annual reports, and would invest their funds in accordance with certain regulations.

The Act required workers engaged in listed occupations to be insured with one of the existing funds or one to be created for the purpose. Two-thirds of the premiums were contributed by the workers, one-third by the employers, and the funds were administered by both groups in proportion to the contributions made. The benefits included medical care and sickness money in case of illness and also in case of accident during the first 13 weeks, i. e., before accident insurance became effective, and in addition maternity and funeral benefits.[11]

[11] For details see Barbara Nachtrieb Armstrong, *Insuring the essentials*, New

German sickness insurance always suffered from a lack of uniformity, since large and prosperous funds were able to offer many additional benefits that smaller funds could not provide. This shortcoming was not due to a lack of wisdom on the part of Bismarck, but merely to the parliamentary constellation that prevailed in the year 1882 to 1883, and no regime from Bismarck to Hitler was able to change it basically, although many improvements were made in the course of time.

The industrial accident insurance was much more controversial because it represented a much more radical departure from the traditional ways of employers' liability. The parliamentary discussion dragged on and on. The old Emperor was mobilized again. In his Message from the Throne of April 14, 1883 he expressed his satisfaction with the progress achieved in the case of sickness insurance and his disappointment that the work on the more important accident insurance bill was not more advanced.

Bismarck made one concession after another in order to get the bill through. In the second draft introduced before the *Reichstag* on May 8, 1882 he had dropped his original plan of a central insurance fund, but still insisted on a government subsidy of 25 per cent. of the costs and on having the contributions shared by employers and employees. The third draft that came before the *Reichstag* on March 6, 1884 no longer foresaw a government subsidy, and it required contributions to be made by employers alone.

Finally, after much manoeuvering and with the support of the Catholic Party of the Center Bismarck had the bill accepted, and it became the law on July 6, 1884.

The Industrial Accident Insurance applied in the beginning only to very limited groups, only to workers employed in manufacturing and mining and to "works officials" of these industries earning not more than 2000 marks a year. This restriction was made on purpose because it was felt that experience should be gathered before the Act be extended to cover other groups. In the following three years, however, from 1885 to 1887 amendments were passed in order to

York, 1932, p. 303 ff.—I. S. Falk, *Security against sickness*, Garden City, N. Y., 1936, p. 93 ff.

include workers engaged in transportation, construction, agriculture and forestry, seamen, members of the armed forces, and federal employees. At the same time Sickness Insurance was extended to these groups in so far as they were not covered in some other way.

Accident insurance provided death benefits, disability and medical benefits. In case of fatal accident, benefits included compensation for funeral costs and pensions to dependents. Disability and medical benefits were granted from the fourteenth week on, and included complete medical care until restoration, and part of the wages, usually two-thirds, but in certain cases the full wages were paid.

Employers were required to organize mutual trade associations (*Berufsgenossenschaften*), one for every industry involved.[12] The associations were self-governing bodies that administered the insurance act, each one for its own industry. The workers had no part in the administration but were represented in the arbitration courts. During the first year benefits were paid by the government through the post offices. Thereafter contributions large enough to reimburse the government and to build up a reserve fund were collected from the employers.

This was a novel method of administering insurance. It was Bismarck's own favorite idea that he would have liked to see applied in all fields of social insurance. He succeeded in the case of accident insurance because it was new and began without precedents, while sickness insurance had to reckon with the vested interests of the many already existing funds. Bismarck was a strong advocate of the corporative state. He would have liked to see society organized in trade associations, the representatives of which would have constituted the parliament.[13] But he did not live in the Middle Ages, and the time for fascism had not yet come.

4.

The next step in social security legislation was to be the introduction of *Old Age and Invalidity Insurance*. It had been announced in the Emperor's Message as early as 1881, and the intention was

[12] There were 67 such associations in 1926.

[13] See e. g., *Gedanken und Erinnerungen*, Neue Ausgabe, Stuttgart and Berlin, 1922, vol. I, p. 18.

to have it follow immediately after the enactment of accident insurance. But there was little enthusiasm. The Social-democrats who at that time were still under the ban of the Socialists Act of 1878 were opposed to this as to the other insurances; and so were the Liberals. In this case the Conservatives were apprehensive also. They thought that old age and invalidity insurance would benefit the industrial workers of the Western provinces more than their own agricultural laborers of the Eastern provinces. The *Reichstag*, besides, was busy with amendments to the previous acts. Thus several years passed before action was taken.

Bismarck was getting on in age and was anxious to see his work completed. In September 1887 he took a rather unusual step and published the draft of a bill before it had even been submitted to the *Bundesrat*, in order to arouse public opinion.[14] He had already abandoned his original plan of having the insurance vested in a federal fund and of having it financed entirely by the state. He now wished to have it administered by trade associations and to have the costs contributed by employers, employees, and the state in equal parts. When the bill came before the *Bundesrat* in April 1888, it was amended considerably, and when it reached the *Reichstag* in November 1888 it foresaw the establishment of regional insurance funds[15] controlled and guaranteed by the government. The premiums were to be paid by employers and employees in equal parts, and the state was to contribute a subsidy to the pensions paid out and the costs of administration. The insurance covered all manual workers irrespective of income and other employees earning not more than 2000 marks a year. It provided, after a waiting period, pensions to individuals disabled by sickness and to all insured persons upon reaching seventy years of age.[16] The bill thus filled a gap left open in the other insurance system.

After long and heated debates, the bill was passed on May 24, 1889 with a small majority, 185 votes to 165. It became the law on June 22, 1889.

[14] Grundzüge zu einer gesetzlichen Regelung der Alters- und Invalidenversicherung der Arbeiter, in: *Annalen des Deutschen Reiches*, 1888, p. 21 ff.

[15] There were 29 such funds in 1926; the region usually coincided with one state.

[16] The age limit was lowered to 65 in 1916.

5.

The old Emperor William I died in March 1888 and was succeeded by Frederick III who died a few months later. His son William II ascended the throne. He was young and ambitious, and less than two years later Bismarck was forced to resign.

His work was completed. He had unified the German states, had given the empire a strong position on the European continent. Industry and commerce were developing rapidly and Bismarck himself, by origin a feudal landowner, had gradually become an exponent of the new order. Before he retired he had the satisfaction of seeing his social security legislation carried through.

Social insurance brought great benefits to all groups of the population. It guaranteed medical care to the increasing army of wage-earners, not as a matter of charity but as a right that they acquired through their labor. It guaranteed them compensation for the loss of wages due to illness or accident, and pensions when they lost their earning capacity as a result of illness, accident, or old age. It gave security to their families to whom the benefits were extended in increasing measure.

The employers and society at large were benefited by having a healthier working class and by being relieved of an endless number of indigents under a system that distributed the costs evenly and under which everyone contributed according to his ability.

Bismarck's social legislation was a pioneering venture that required much imagination and courage at a time when there was little experience in mass insurance. It had to be carried through in the course of eight years against much parliamentary opposition and had to bow before the vested interests of existing organizations. As a result of the many compromises, the German social insurance system lacked unity and became an extremely involved and complicated mechanism, a defect from which it has suffered to the present day.

In 1889 the Old Age and Invalidity Insurance Act was passed with a very small majority. Ten years later, in 1899, a very important amendment to the Act came before the *Reichstag* and was carried with the votes of the Social-democrats almost unanimously

with only 3 dissenting votes.[17] In other words, social insurance by that time was no longer a controversial issue but was accepted by all political parties. Hardly a year passed without amendments, the general purpose of which was to extend the coverage to ever larger groups, to increase benefits, and to lessen the risks by developing preventive measures. In 1911 a special insurance was established for salaried employees providing invalidity and old age pensions and also pensions to survivors. It was no longer a workers' insurance, but one for the middle class. And finally the insurance system was completed when compulsory *Unemployment Insurance* was adopted in 1927. Whether Germany was a monarchy, a republic, or a totalitarian state, social insurance continued to be extended until it covered the great majority of the population.

Bismarck failed in one point. He did not succeed in destroying the Social-democratic Party and other socialist organizations of the country, as he had hoped. He came to realize that a strong and justified popular movement cannot be suppressed either by police regulations or by social insurance laws, for the simple reason that social insurance does not solve the basic problems of labor. It mitigates the hardships of the capitalist system, and at the same time prolongs its existence.

In spite of the great handicap of the Socialists Act that was not discarded before October 1890, the Social-democrats increased their vote continually. They had 9 seats in the *Reichstag* in 1878, 12 in 1881, 24 in 1884. In the elections of 1887 they increased their total number of votes but lost a number of districts and consequently 13 seats, but in 1890 they came back with 35 seats. They won 44 in 1893, 56 in 1898, 82 in 1903, and in 1912 they had become the largest and best organized political party of the country with 110 deputies in the *Reichstag*.

Thus Bismarck's social legislation did not destroy the socialist movement, but it had far-reaching political consequences nevertheless in that it greatly contributed toward killing the revolutionary policy of the Social-democratic Party. Bismarck died in 1898, too early

[17] Robert Einhauser, Die Novelle zum Invalidenversicherungsgesetz, *Zeitschrift für Socialwissenschaft*, Berlin, 1899, vol. II, p. 520 ff.

to see the full results of his policy, the development of the revisionist movement within German social-democracy.

What happened was exactly what the labor leaders of 1882 who opposed Bismarck had feared. The benefits of social security legislation became an immediate gain to the working class, a gain that it was anxious to increase and very much afraid to lose; a gain which socialist parties in other countries were struggling to attain. German social-democracy grew so rapidly and gained so much that it became a group with vested interests, "revised" its policy and was ready to cooperate with the capitalist state, losing sight of its real goal. Bismarck's intention was thus ultimately fulfilled.

Under the events of the First World War the revolutionary left wing split off, but when the monarchy was overthrown in 1918 and the Social-democrats found themselves by far the largest party of the country they thought that the battle had been won, and that it would be possible to establish socialism gradually in a parliamentary way. But then the crash of 1929 and the bitter events of 1933 destroyed their political gains of half a century and reminded them that a symptomatic therapy may alleviate pains, but that it does not remove the causes of the disease.

6.

One last question must be raised in this connection. What was the attitude of the German medical profession toward social insurance and particularly toward sickness insurance?

In order to find out what the physicians thought of the legislation that was so hotly debated in the *Reichstag*, we looked up the leading medical journals of the period and also consulted dozens of autobiographies of contemporary physicians.[18]

It was rather surprising to find that with very few exceptions neither the journals nor the biographies mention sickness insurance.[18a] Rudolf Virchow who had been the leader in the medical reform movement of 1848 wrote 128 papers and notes from 1881 to 1883.

[18] I am greatly indebted to Dr. Erwin H. Ackerknecht for the help he gave me in this search.

[18a] The *Aerzliches Vereinsblatt*, the organ of the German Medical Association, printed an abstract of the Sickness Insurance Act in its October number of 1883.

They were all on subjects of physical anthropology, and he did not devote one line to the problem of social insurance.[19] The medical profession was not consulted when the bills were in the making and apparently did not care to be consulted.

This indifferent attitude seems strange when we remember how vociferous physicians became in England, France, and wherever the question of sickness insurance came up; and yet there are very good reasons for it. One is that the idea of compulsory sickness insurance was nothing new to the German physicians. They had been the first to suggest it in 1848, and although there was no universal insurance before 1883, yet there already existed a great many local sickness funds, membership in which was obligatory for certain groups of wage-earners. The principle, therefore, was accepted by the profession long before 1883, and there was no reason for it to become excited over the new legislation.

Another and a very important factor was that in the 1880's, i. e. before the second industrial revolution, the relative number of wage-earners was much smaller than in the 20th century. The doctors served the middle class primarily and made a living from that group. Whatever practice they had with non-insured workers was indigent practice that was not or very poorly remunerated. Hence the extension of insurance to all wage-earners could only serve the economic interests of the profession.

That this was actually the case is evidenced by the fact that once insurance was established, the number of physicians increased much more rapidly in Germany than in other countries that had no compulsory sickness insurance. There was more money available to doctors and therefore more young people entered the profession. The figures are very striking:

In Germany[20] from 1889 to 1898 the population increased from 46,857,704 to 52,279,901, or by 11.5 per cent., while the number of physicians increased from 15,824 to 24,725, or by 56.2 per cent.

In Great Britain[21] from 1891 to 1901 the population increased

[19] J. Schwalbe, *Virchow-Bibliographie*, Berlin, 1901.

[20] M. Pistor, *Deutsches Gesundheitswesen*, Berlin, 1890.—*Das Deutsche Reich in gesundheitlicher und demographischer Beziehung*, Berlin, 1907.

[21] *Census of England and Wales 1911, General Report with Appendices*, London, 1917.

from 29,002,525 to 32,527,843 or by 12.8 per cent., while the number of physicians increased from 23,925 to 27,884 or by 16.0 per cent.

In the United States [22] from 1890 to 1900 the population increased from 62,947,714 to 75,994,575, or by 20.7 per cent., while the number of physicians increased from 104,805 to 132,002, or by 25.9 per cent.

From 1884 on, medical societies became more articulate. One of the weaknesses of the insurance act was that it did not regulate the relationship between funds and physicians. It was left to the discretion of the individual funds to contract with doctors in any way they pleased. They could appoint doctors on salaries or could remunerate them on a capitation or a fee-for-service basis. Some funds were small, had little money available, and were inclined to contract with the cheapest doctors they could find. Many physicians, on the other hand, were only too ready to underbid each other. Conflicts were unavoidable and lasted until the insurance physicians organized in 1900 a national association, the so-called Hartmannbund.[23] It permitted them to negotiate with the funds collectively, established standard contracts by which funds and physicians had to abide, and created a number of welfare institutions for its members.

[*To be continued.*]

[22] U. S. Bureau of the Census, Special Reports, *Occupations at the Twelfth Census*. Washington, 1904.

[23] *Verein der Aerzte Deutschlands zur Wahrung ihrer wirtschaftlichen Interessen*, named after its founder, Dr. Hermann Hartmann. It became the economic division of the German Medical Association (*Deutscher Aerztevereinsbund*).

THE EPIDEMIOLOGY OF INFLUENZA

Illustrated by Historical Accounts *

EUGENE P. CAMPBELL

Influenza has played an important role in the development of our modern political, economic and social structure. But it has remained a medical enigma for several centuries. The intermittent visitations of this disease have probably stimulated more epidemiologic thought than those of any other malady and yet few great advances were made in the solution of its problems until the present century. This delay may be due in part to the fact that the epidemics were sudden in onset, caused great social disorder for a few weeks, and then subsided nearly as quickly as they appeared.

Influenza's periodicity resulted in a jack-rabbit type of interest which produced relatively little real progress toward our goal of control. During the period of one to three years after an epidemic there is much study and investigation but this gradually subsides until the next epidemic. However, during the past three decades long strides have been made in our knowledge of influenza. We have carried our struggle with this disease to the laboratory with its slide rules, chick embryos, exposure chambers and sickening mice. At least three viruses have been discovered as causative agents. Vaccines of uncertain value are being studied and, though we cannot yet control this disease, it seems that an effective means of prevention is almost within our grasp. Granting these advances, I should like to turn to some historical accounts which bring out the origin of a few of our modern epidemiologic conceptions of influenza.

Nomenclature

A multitude of names have been used to designate this disease. Probably the most widely used term in the past has been distemper. To be sure it is more generic and does not indicate the idea of specificity that our modern term connotes. The term influenza was proba-

* Presented at the Nov. 10, 1942 meeting of the Section of Medical History of the College of Physicians, Philadelphia.

bly first used in the middle of the 14th century in Italy. The earliest place in professional English that I am able to find the term is the 2nd edition of Huxham's book on fevers (1750) (1).

In the London Magazine for March 26, 1743 a notice appears " Occasioned by an article of News from Rome of a Contagious Distemper raging there, call'd the Influenza " from which the following excerpt is taken:

> The good people of England were visited with the Influenza, as long ago as Richard IId's time; all his Ministers, Counsellors, Judges and Favourites, were tainted with it, (to many of whom it proved fatal;) and though conservators of the public health at last arose, it doth not appear that they were able wholly to eradicate the Disease. . . . In the Rein of Henry VIII, which had never been known before; those who endeavour'd to check its progress, or diminish its violence, being for the most Part, destroyed in the Attempt. . . . The patient immediately upon being seized with it, falls into almost all the Phrensies, treated of by Ovid; like Narcissis dooting on himself, like Lycaon longing to prey upon human flesh, like Midas coveting to turn all he touched into Gold, like Penelope unravelling in the Dark, what she had wove in the sunshine; and, as if he had tasted Lethe, forgetting alike his former Principles and Friends.

In an earlier issue of the same magazine (Jan. 1733) a total of 1588 deaths are recorded, an increase of 805 above the expected number presumably due to influenza (2). Of the origin of the term influenza, Robert Johnson wrote: " When astrology took the lead of true science, and people began to fancy all terrestrial things were governed by the heavens, some Italian doctors found out that this distemper proceeded from the influence of the stars, and therefore gave it the name of influenza " (3).

Terms with local geographic significance were legion; the Picardy sweat, the English sweat, the Hungarian sickness and the Gallic malady are examples. The attempt for one nationally minded people to place the blame for the disease on another group can be seen in such names as the British pest, used by the Germans. In 1709, Londoners called influenza the Dunkirk rant or ague. During the pandemic of 1918, we in America frequently referred to it as the Spanish influenza.

The various symptoms so characteristic of this disease are reflected in such designations as the " punch between the shoulders " or " knock-me-down-fever " of the Londoners (4).

During 1889-92, the influenza pandemic was called morbus maximus epidemicus because up to that time it was claimed to be the most destructive of all epidemics. It is an interesting fact cited by Crookshank (5) that not until 1918 did the Royal College of Physicians first confirm the use of the term influenza instead of il catarrho epidemico.

There is little uniformity of opinion regarding the date of the first epidemic of influenza. It is unlikely that a search would reveal this

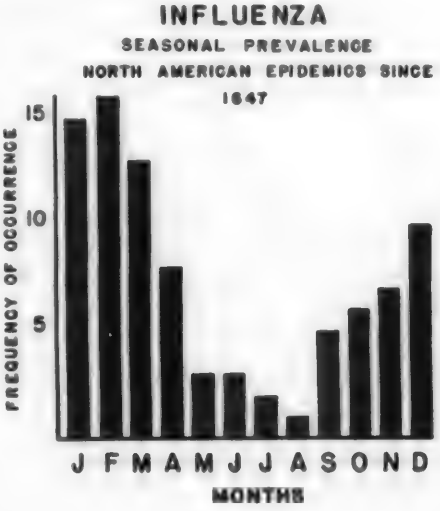


CHART 1.

date, since it is recognized that the antiquity of most disease processes far exceeds recorded time. Some interpret certain of the writings of Hippocrates or Thucydides as descriptions of influenza. Other tracts of the 9th, 10th, 12th and 13th centuries are accepted by some authorities as descriptions of influenza. The first complete description of influenza that I have been able to study is that of Dr. Short, reproduced by Thompson (6). Short's description of the epidemic of 1510 leaves little doubt of the nature of this epidemic.

Table 1 lists the time and place of occurrence of the pandemics and more important epidemics since 1510.

Theories of Causation

Historical accounts are replete with hypotheses concerning the causes of influenza. Comets were associated with the epidemics of 1510, 1580, 1737, and 1743. Volcanic eruptions were considered to be either the cause or the precipitating feature of the 1557 (Etna), 1675 and 1735 (Vesuvius) epidemics. Meteors and meteorites, ozone, aurora-borealis, sudden changes in weather and insect scourges were all causally related to influenza by one author or another. In 1850 a Dr. Grove proposed the theory that epidemics were produced by vegetable germs borne on the wings of the wind. The wide acceptance of the Pfeiffer bacillus as the cause was finally terminated in 1933 when Smith, Andrewes and Laidlaw demonstrated beyond question that a filtrable virus is the etiologic agent. The discovery of a second virus by Francis and more recently the idea that there is a large group of unidentified viruses which may cause influenza has stimulated much new interest.

Epidemiologic Characteristics of Influenza

Morbidity and Mortality: The extensive epidemiologic studies of influenza following the 1918 pandemic have crystallized many of our ideas concerning incidence and fatality. Reliable morbidity statistics are not available for any epidemic prior to 1918. Fairly accurate figures for deaths are available for 1847 and 1889-92 (7), but no systematic attempt was made before 1847 to keep the log of these two important features. There are available, however, a number of statements by individual physicians which indicate in a rough way the severity of some of the earlier outbreaks.

Sydenham remarked on the prevalence of the "coughs" in 1675 in the following terms: (8) "No one escaped them, whatever might be his age or temperament; and they ran through whole families at once."

More detail is contained in the interesting description of Thomas Molineux of Dublin who wrote of the 1688 epidemic: (9) "About

the beginning of July, 1688, this fever was first observed to appear here in Dublin; and it so universally seized all degrees of men whatever, that not above one in fifteen escaped. . . . So transient and favorable was this disease, that it seldom required help of a physician; and of 1,000 that were seized with it, I believe scarcely one died; and by the middle of August following it wholly disappeared; so that its whole period was about seven weeks."

The epidemic of 1693 merited even a more detailed description by the same author. "One way or other it universally affected all kinds of men; those in the country, as well as the city, those that were much abroad in the open air, and those that stayed much within doors, or even kept close in their chamber; those that were robust and hardy, as well as those that were weakly and tender; men, women and children in all ranks and conditions, the youngest and the oldest; though I think if it were favorable to any sort, it most spared those that were very aged, among whom I knew several that were not the least troubled with it, yet it seized so universally, that not one in thirty, perhaps I might safely say none, escaped it."

Knowing John Huxham's keen interest in the problems of fevers it is not surprising to find an account of influenza in his writings. He is not only credited with first using the term influenza in professional English but he described the epidemic in Plymouth, England (1732-33) in the following words: (10) "About this time a disease invaded these parts, which was the most completely epidemic of any I remember to have met with; not a house was free from it; the beggar's hut, and the nobleman's palace were alike subject to its attacks; scarce a person escaping either in town or country; old and young, strong and infirm, shared the same fate . . . but still, considering the great multitude that were seized by it, it was fatal to but few, and that chiefly infants and consumptive old people."

Extensive studies (11, 12) of the 1918 pandemic reveal the fact that the incidence of influenza is slightly greater among people of a low economic level as compared with high levels of income. Considering the lack of careful statistical analyses in earlier times it is no wonder that this fact was not noted.

The frequently quoted letter of Robert Whytt (13) to Sir John Pringle entitled "An Account of an Epidemic Distemper at Edin-

burgh, and several other parts in the South of Scotland, in the Autumn of 1758," contains the following: " Not one out of six or seven escaped . . . few died of this disease, especially when it first appeared, except some old people."

Robert Johnson (3) wrote " An Inaugural Dissertation on the Influenza " for his medical degree, which was granted by the University of Pennsylvania, May 8, 1793. This dissertation was prompted by the epidemic which occurred in 1789 in Philadelphia. His description is largely taken from Benjamin Rush who was Robert Johnson's professor of medicine. The following quotation probably had its origin in the lectures by Dr. Rush: " A physician of this city, whose practice is very extensive, assures me that he remarked old people as well as children, were *less* subject to the influenza than persons in middle life."

The three epidemics occurring in Philadelphia (chart 2) were admirably described by Dr. Rush (14). He observed that " No profession or occupation escaped it " but that " out of five and thirty maniacs in the Pennsylvania Hospital, but three were affected by it." During the 1918 pandemic it is interesting that many mental institutions, prisons and some isolated schools missed the epidemic entirely.

In 1847 William Farr recorded 1775 deaths from influenza in London, which was then a city of about two million people. Though the number of cases is unknown, Parsons (7) records 5,248 deaths in London as a result of the epidemic of 1890, 1891 and 1892. A house to house canvas of the 1890-1892 epidemic was made in Germany by Friedrich (15) who found that approximately 30% of the people had been affected. This is the first attempt to record the morbidity rate due to this disease in the general population.

Not until 1918 do we have accurate morbidity and fatality figures, but the literature is too extensive to summarize here. As a result of Frost's studies (11) one can say that 20-25% of the population of this country was affected in the 1918 epidemic. The case fatality was approximately 2.0%, but one must not under-estimate the significance of this apparently low rate. Translated into other terms this means there were approximately 3½ times as many deaths in the United States per week during this eight weeks period as would have been expected had this epidemic not occurred. In Philadelphia the

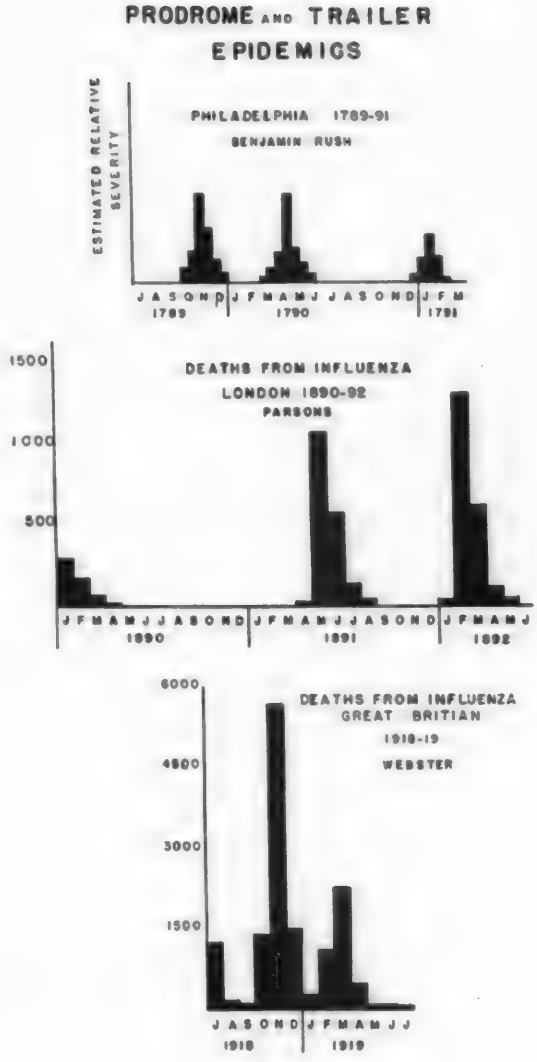

PRODROME AND TRAILER
EPIDEMICS
ESTIMATED RELATIVE SEVERITY
PHILADELPHIA 1789-91
BENJAMIN RUSH
J A S O N D J F M A M J J A S O N D J F M
1789
1790
1791
1500
1000
500
DEATHS FROM INFLUENZA
LONDON 1890-92
PARSONS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J
1890
1891
1892
6000
4500
3000
1500
DEATHS FROM INFLUENZA
GREAT BRITIAN
1918-19
WEBSTER
J A S O N D J F M A M J J
1918
1919

CHART 2.

death rate for the week ending October 18, 1918, converted to an annual basis was 158.3 per thousand (16). Under normal conditions the expected death rate for the same period would have been about 15 per thousand. Thus, for the country as a whole there were about 3½ times as many deaths as would normally be expected whereas in certain areas there were as many as ten times the expected deaths.

Seasonal Incidence: The seasonal characteristics of influenza as it has occurred on the North American continent are presented in chart 1. From a study of the time of occurrence of pandemics throughout the world it appears that they have more of a tendency to occur during the summer months than do the less severe epidemics. The implications of this fact are many; however, the identity of some of these summer epidemics is not entirely clear-cut despite the fact that many authorities have agreed that they were influenza.

Satellite Epidemics: The epidemics of 1733, 1789-1791, 1830-1832, 1889-1892, 1918-1919 were characterized by at least one, and often two, milder epidemics occurring either just before or just after the major outbreak. These satellite epidemics have been called prodromal and trailer (4) epidemics because of their tendency to precede or follow the more serious outbreak within a year. In chart 2 the epidemics of 1789-1791, 1889-1892 and 1918-1919 have been selected to illustrate this point. In some instances physicians have observed that a person may be affected with the influenza during each visitation (14). Others have pointed out the fact that immunity seemed to spare those affected during the spring epidemic in 1918 from an attack during the fall outbreak. Our present concepts regarding the evanescence of the immunity to the influenza A or B virus make doubtful and uncertain these earlier observations.

The introduction of fresh non-immune recruits into large troop concentrations during the World War I produced trailer epidemics (chart 3) that should not be confused with those pictured in chart 2. The cause of these secondary outbreaks was logically ascribed to the periodic introduction of large groups of susceptible individuals into the epidemic area. This could not be advanced to explain the prodromes or trailers of the 1789-1791, 1889-1893, and 1918-1919 epidemics.

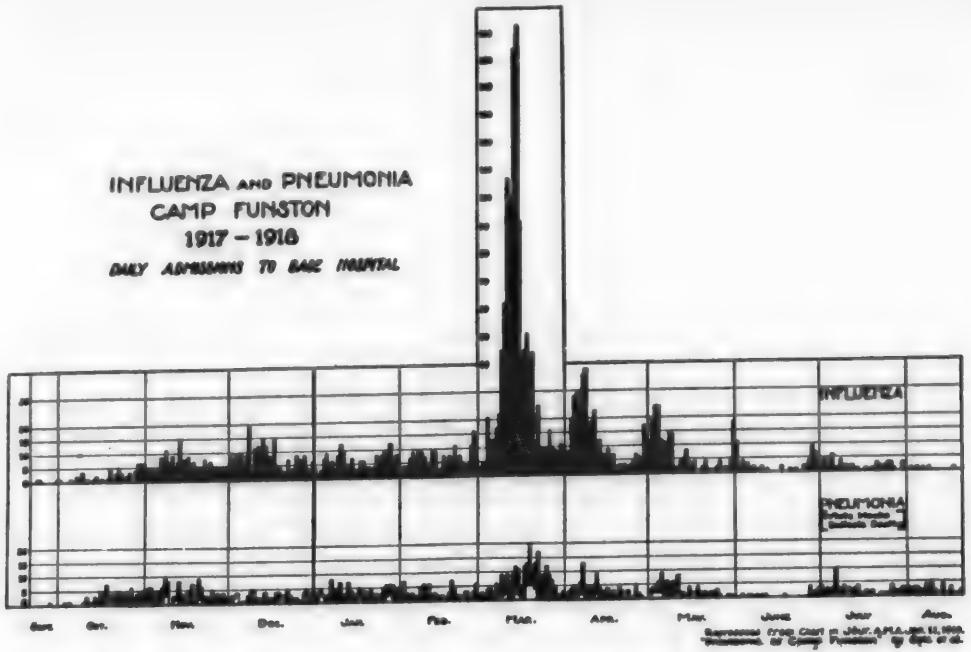
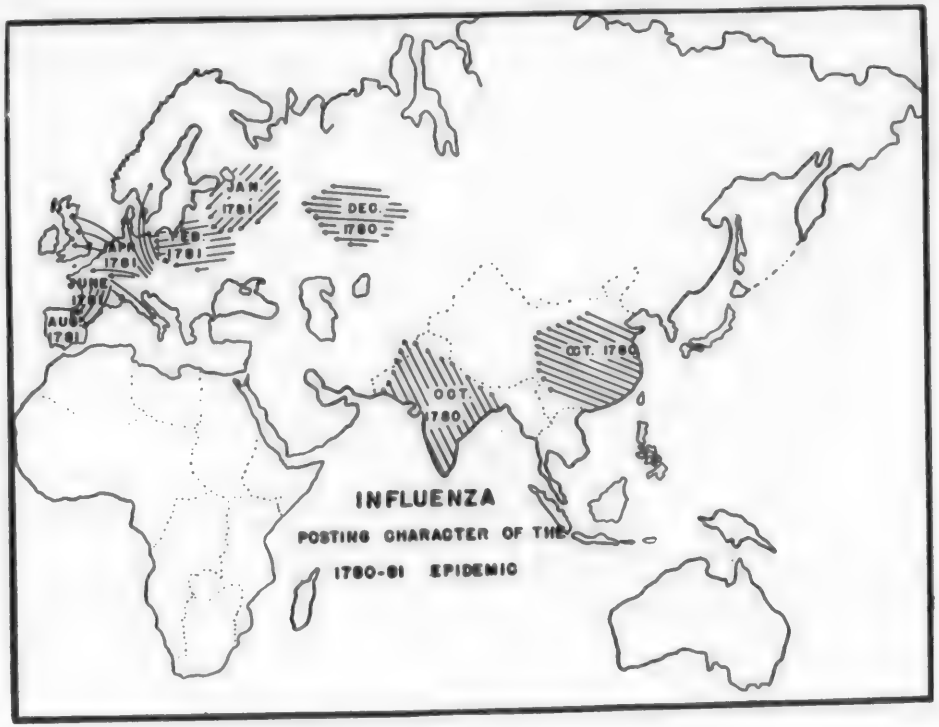


CHART 3.—The recrudescences of April, May and June were associated with the introduction of fresh, non-immune troops into Camp Funston. Reproduced from Vaughan (16).

Posting Character: Another epidemiologic characteristic of influenza is its ability to travel from one country to another " as fast as man could travel." This interesting feature has stimulated much interest and is described by earlier physicians as the " posting " character of the disease. The descriptions of its spread from one country to another appear in the earliest accounts of influenza; in fact, there have been few epidemics that did not cross and recross political boundaries. The posting characters of the 1780-1781, 1830-1832 and 1918-1919 epidemics are illustrated in charts 4, 5, and 6. That the virus is actually carried from one area to another on the person of some human being, by air or some other convenient means, seemed to be a complete and sufficient explanation until the present century. The marked increase in our rate of travel, far out of proportion to the increase in rate of spread of the 1918 and 1940 epidemics, makes it seem likely that some other factors are operating. There is some evidence to support the idea that the various influenza viruses are much more common than was once thought. It is conceivable that epidemics are more analogous to tidal waves than to floods. The importance of other factors such as changes in virulence, duration of immunity, inter-virus relationships are still unknown at this time.

Periodicity: As early as 1889 Brownlee attempted to account for the trailers of the great pandemic on a 33 week rhythm basis. It worked until 1895 when the " rhythm broke." It is rare for biological phenomena to fit exactly a mathematical formula but there is no doubt that many difficult epidemiologic problems have been solved by the use of mathematical formulae. In 1920 Stallybrass (19) hypothecated two and possibly three coexisting but independent 33 week rhythms and in 1939 Webster (20) charted two 33 week phases which, in view of the number of viruses causing this disease, is a suggestive hypothesis to explain its periodicity. In England there were major epidemic peaks of influenza in 1929, 1933 and 1937. This four-year cycle was the cause for the prediction that 1941 would be a peak year (21). This did not prove to be the case and once again the solution to the problem of periodicity becomes a " flighty purpose " still eluding our efforts.

I wish to acknowledge the helpful suggestions and criticisms offered


JAN. 1781
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INFLUENZA
POSTING CHARACTER OF THE
1780-81 EPIDEMIC

Chart 4.

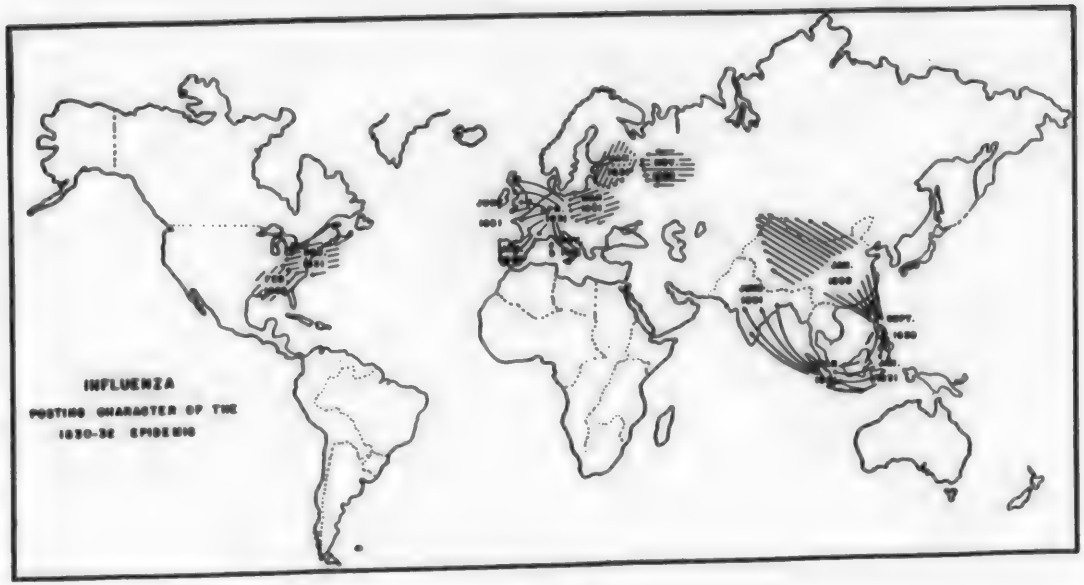

CHART 5.

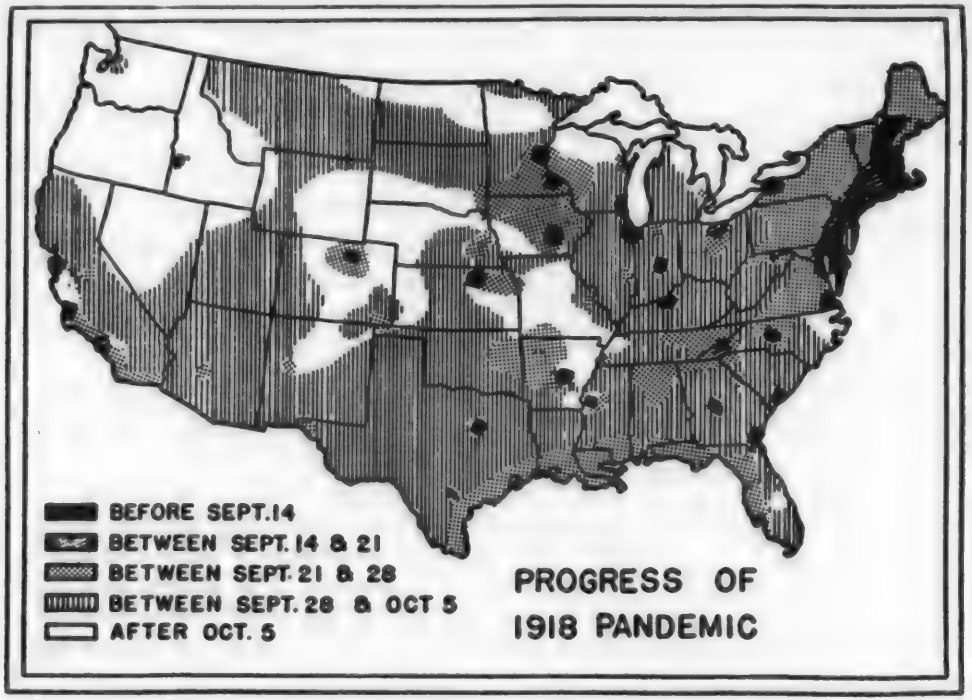

CHART 6.—Chronological development of the 1918 influenza epidemic. The black areas were thought by Sydenstricker (17) to be "centers of radial movements . . . and probably served as foci in its development." Reproduced from John R. Mote (18).

during the preparation of this paper by Dr. E. Douglass Burdick, Dr. R. L. Campbell and Miss F. Sullivan.

TABLE 1

EPIDEMIC INFLUENZA

(Some Notable Outbreaks) *

* Modified from Hirsch, A.: Handbook of Historical and Geographical Pathology, Sydenham Soc., London, 1885.

Pandemics	Epidemics	Geographic Distribution	Remarks
	1510	General distribution in Europe	The English sweat. Frequent abortions.
	1557	All of Europe	The English sweat. "Very fatal in children."
1580		Asia, Europe, Africa	August-September—A comet before this epidemic. Encephalitic type was frequent.
	1647	N. America, West Indies, S. America	1st recorded epidemic in U. S. associated with an epizootic in horses and dogs.
	1675	Germany, France, Austria, England	Described by T. Sydenham. Very fatal for the aged and pregnant women. Many abortions. Mt. Etna active in 1675.
	1688	England, Ireland	Earthquake and Hurricane associated with this epidemic, it "favored the very old."
	1709	England	A very cold winter. Urine froze under the bed. Thames river froze over.
1729-33		World-wide distribution	Described by Huxham.
	1737-38	England, France, U. S., West Indies	Described by Huxham.
	1742-43	All of Europe	Described by Huxham.
	1758	Europe, N. America	Whytt—"not one out of six or seven escaped."
1767		N. America, Europe	
	1776	All of Europe	Fothergill, "so many people were seized, and in so short a time, and with so little comparative mortality."
1780-81		Asia, Europe, North America	Causes: Noxious insects from China, increased electricity and ozone. For "Posting" character see chart.

1789-90	N. America	Described by B. Rush and R. Johnson.
1830-32	World-wide	Greatest mortality 14 to 45 years. Spared young and old.
1847-48	Eastern Hemisphere, Hawaiian Islands, West Indies	Much bronchitis of "capillary form."
1889-93	World-wide	"Morbus maximus epidemicus."
1918-19	World-wide	Most destructive of all pandemics.

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THE NATIONAL QUARANTINE AND SANITARY CONVENTIONS OF 1857 TO 1860 AND THE BEGINNINGS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

HAROLD M. CAVINS

America's first public health association was destroyed by the Civil War, the "War Between the States."

The Quarantine Convention of 1857, the Quarantine and Sanitary Convention of 1858, and the National Quarantine and Sanitary Convention of 1859 and 1860 represent a virile, forward-looking public health organization that seems to have been overlooked or underrated by most historians. It was a professional voluntary agency of great promise and broadening scope when, at its 1860 meeting, it adjourned to meet "in Cincinnati, on Wednesday of the last week in May," in 1861. The incident at Fort Sumter occurred in April of 1861, and the Convention never re-assembled.

The first convention grew out of the Philadelphia Board of Health, but more specifically it was the brain-child of one of its members, Dr. Wilson Jewell.

Back of the idea of a convention was general dissatisfaction with existing maritime quarantine laws. They displeased merchants and tradesmen because they were cumbersome and restricted or delayed the movement of goods. They did not adequately protect the inhabitants of port cities, and health officers knew it; they were far from uniform, since practices considered "safe" or "legal" in Baltimore were neither safe nor legal in New Orleans, or vice-versa.

Dr. Jewell had had several years' experience as a health officer in Philadelphia. He knew at first hand the defects of the laws of quarantine, as he had tried to enforce them. He was influenced, he said, by a *Conférence Sanitaire* held in Paris in 1851 and 1852, where quarantine had been an important topic of discussion. In the fall of 1856 he brought before the Philadelphia Board of Health the question of calling a national convention of "judicious and well-

informed delegates" to discuss the problem. After review of the proposition, the following resolution was unanimously adopted at a stated meeting of the Board on October 29:

> Resolved, That a Committee of Three, with the President, be appointed to correspond with the Boards of Health of New York, Boston, Baltimore and New Orleans, on the propriety of calling a convention of delegates from the various boards of health in the maritime cities of the United States, for the purpose of a conference in relation to the establishment of a uniform system of revised quarantine laws.[1]

The letters of invitation as dispatched referred to present quarantine laws as "antiquated, defective," as "positively oppressive in their operation upon the interests of commerce, when rigorously exacted," and as having failed "in accomplishing the benevolent purpose for which they were originally formed." The suggestion was made that Philadelphia's central location commended it as the seat of the Convention, with April of 1857 as the date. The invitations were signed by Wilson Jewell, as Chairman of the Special Committee on Quarantine.[2]

The first Quarantine Convention materialized in May, not April, of 1857. The Philadelphia Board of Health had invited delegates from boards of health, boards of trade, and from "two regular medical societies" in each of the principal seaboard cities. In all, the names of seventy-three delegates, from nine states and twenty-six different authorities were read and entered upon the register. Six delegates represented Boards of Trade of Baltimore and Philadelphia; twenty-two were laymen (mayors, councilmen, aldermen) in almost every case members of Boards of Health; the rest (nearly fifty) were physicians, representing usually a medical society or a Board of Health. On analysis, it is seen that the group is definitely professional in nature, although by no means limited to the medical profession. Those not physicians were in attendance because they were city officials or were representing business groups; they were not merely interested laymen.

[1] *Minutes of the Proceedings of the Quarantine Convention* (Philadelphia: Crissy and Markley, Printers, 1857), p. 6. All information in regard to this series of Conventions is derived from the four volumes that constitute the official reports of the organization.

[2] *Ibid.*, pp. 7-8.

In welcoming the guests that had assembled in the Supreme Court Room on that May morning of 1857, Dr. Jewell congratulated them as "the honored delegates to the first American congress ever convened for sanitary reform."

> You inaugurate a movement that, in my estimation, should not be confined exclusively to the learning, the wisdom and the experience of our time-honored medical profession, but one in which the intellectual resources to be found in every department of science and the arts should be sought out and heartily enlisted. . . .
>
> . . . We meet today on an untried platform. Our commission is as novel to us as it is new in our history. . . .[3]

Referring to the work ahead as that of "correcting errors in the public mind—errors founded upon prejudice and ignorance," Dr. Jewell continues:

> I hail it as evidence of the dawn of a new era in the domain of American science that we are convened to deliberate upon questions relating to the improvement of public health. It is the introduction to a field of learning almost unexplored in this country . . . as important as it is uncultivated.
>
> Public hygiene . . . with us, has until late years received but little attention. It lies almost a dreary waste in our annals of progressive science.[4]

Dr. Jewell waxes eloquent in the best mid-nineteenth century style as he considers what this Convention can mean to the

> solitary devotee, earnestly engaged in his sanitary and statistical labors, unaided and alone. Faint, yet pursuing, with his eye steadily fixed upon the star of promise, he presses onward and still onward, gathering encouragement and strength as he advances, until at length he may behold the bright spots of verdure freshen and increase in his rugged pathway; for the first time, in the assembling of this intelligent convention is he cheered with the sight of his favorite study taking its position amongst us with kindred sciences; and now he may feel that his sanitary desert is beginning to rejoice and blossom as the rose, and that his solitary wanderings are to be made glad by the footprints of his countrymen, marshalled in the promotion of the science of health. . . .[5]

The speaker cites progress in other fields, notably the development of steam and the electric telegraph, and laments that "the councils of our nation have legislated upon almost all topics save

[3] *Ibid.*, p. 4. [4] *Loc. cit.* [5] *Ibid.*, pp. 4-5.

that of public health." He says it is but in accordance with the spirit of the age that special sanitary legislation be recommended and administered; that

> our greatest real public want in this enlightened latter half of the nineteenth century is a judiciously devised and faithfully executed code of internal and external sanitary laws.
>
> And this, sir, is the paramount object for which we have been brought together today. . . .[6]

It was moved that a committee of nine, made up of one delegate from each state,[7] be appointed to nominate permanent officers of the Convention. As a result of their action Dr. Wilson Jewell of Philadelphia was made President; Dr. E. H. Barton of New Orleans and Hon. Alex H. Rice, Mayor of Boston, were named Vice-Presidents, and Dr. Edward Hartshorne of Philadelphia and Homer Franklin, Esq., of New York secretaries.

On the second day of the Convention (May 14) fifty-four delegates reported. In two sessions, some twenty-three different propositions were voted upon, some to be passed, some amended, some tabled. For instance, the eighth proposition, providing that "no vessel should be admitted to a port until her hold is freely and fully ventilated, nor until the bilge water is entirely removed," was amended to read "no vessel arriving between the first of May and the first of November should be admitted . . . ," etc. During the day's deliberations the diseases of typhus fever, cholera, and yellow fever were specifically mentioned.

The third and final day brought action on a name. It was "Resolved, that hereafter the name of this Convention shall be The Quarantine and Sanitary Convention."

The final report of the Convention voiced its objections to "stagnant and putrid bilgewater," "droppings or drainage from putrescible matters," "filthy bedding, baggage and clothing of emigrant passengers," and "air that has been confined." It recommended that if emigrants "are not protected against smallpox, they should be vaccinated," and approved the "introduction of increased comforts

[6] *Ibid.*, p. 5.

[7] Eight of the nine men named were physicians.

for crews and passengers, and the ventilation and purification of vessels by a more effectual method." [8]

The Convention adjourned to meet in Baltimore in 1858.

In welcoming the eighty-six delegates,[9] Dr. William M. Kemp of Baltimore referred to the "high ultimate purpose of this body" as the development of "a code of Quarantine and Sanitary Regulations which shall embrace every necessary safeguard for the security of health . . . at . . . little embarrassment . . . to the very active spirit of commerce." [10] He spoke of the Philadelphia convention of the year previous as the first national assemblage to deliberate upon public health, and said his answer to those who taunted that no state had "moved in the adoption of your enunciated principles" was that no one had hoped for the adoption of "the present unfinished work."

The Business Committee seems to have been of the same mind, for at the afternoon session its spokesman, Dr. Wilson Jewell, said that in spite of dissatisfaction with the "medley" of existing regulations, "more information is needed."

> Nothing short of a more enlarged field of investigation into the merits of this great question, and an extensive circulation of this information when obtained will alone secure a favorable result.

In brief, Jewell proposed a Committee

> to prepare with great care in time for another convention, comprehensive reports on the various questions immediately connected with quarantine; and that some plan be adopted, either through the influence of Congress or the Smithsonian Institution to give this report the widest possible circulation.[11]

More specifically, four subjects were assigned for inclusion in this report. One dealt with the history of quarantine; a second, the question whether quarantines secured the objects for which they were intended; third, consideration of such reforms as would make

[8] *Ibid.*, pp. 40-43.

[9] Forty-four of the eighty-six were physicians.

[10] *Minutes of the Proceedings of the Second Annual Meeting of the Quarantine and Sanitary Convention* (Baltimore: Printed by John D. Toy, 1858), p. 7.

[11] *Ibid.*, p. 16.

quarantine more efficient and less burdensome; and last, a proposal for a uniform system of quarantine laws, if such were feasible.

Most significant action growing out of the Baltimore convention was the appointment of two committees, one on External Hygiene, or Quarantine; the other on Internal Hygiene, or the Sanitary Arrangements of Cities. With this step the organization greatly enlarged its scope and interests. By this expansion it became much more nearly a predecessor of our modern public health organizations.

At the Third Convention, held in New York on April 27-30, 1859, Dr. Wilson Jewell was still very much the leading spirit. After reviewing the brief history of the organization, he said:

> I view the Quarantine and Sanitary Convention as a permanent institution; an association destined in the broad expanse of its future labors, to revolutionize the public mind and will on the great question of Sanitary Legislation. The work of Sanitary Reform in our country has commenced in earnest, through the instrumentality of this Convention.[12]

If this sounds a bit like a proud father predicting great things for his three-year old, it must be remembered that the Convention was largely of Dr. Jewell's making; and the reader who, today, looks through these records of eighty-odd years ago is impressed with the rich opportunities for discovery and service just ahead.

An early item of business was the election of officers: a president, twelve vice-presidents and six secretaries. The president, Dr. John H. Griscom of New York highlighted the opening of the session with a plea for more emphasis upon "internal" measures. To quote him:

> In the city of New York we have lost by Cholera, in twenty-five years, 12,300 inhabitants; by Cholera Infantum 15,000; within twenty years we have lost by Hydrocephalus 12,400; by Cholera Morbus 1400; by Erysipelas 2100; by Convulsions 20,000—i. e., convulsions belonging to and affecting infantile life. These are diseases which are generated within the city, and within the domicile itself, against which the city is defenseless; while Yellow Fever, which can be kept out, and which is not generated amongst us, we have lost in *fifty years* only 600.
>
> This, gentlemen, is my appreciation, stated in round numbers, of the rela-

[12] *Proceedings and Debates of the Third National Quarantine and Sanitary Convention* (New York: Edmund Jones & Co. Printers), p. 6.

tive importance of these two classes of objects which have brought us together.[13]

Griscom's statements were greeted with applause. He had expressed clearly an idea and a trend which subsequent decades were to see much extended.

Committee reports took up much of the time of delegates, and fill many of the 728 pages of the printed *Proceedings*. The four sub-reports of the Committee on Quarantine require 116 pages. The Committee on the Internal Hygiene of Cities had reports on disinfectants, on the importance of "an ample supply of water . . . and the proper disposal of the offal of cities," on "the importance and economy of sanitary measures to cities." This last report took the listener—or reader—through the *cloacae* of Ancient Rome, the problems of ventilation and the question of ablution and bathing, the evils of intemperance, the predilection of cholera for old haunts of disease, through nuisances and slaughter houses, through cow houses and the question of interments in cities. The sub-committee on vital statistics failed to report; but the printing of the Draft of a Sanitary Code for Cities required thirty pages.

It is interesting to note that the volume reporting the third (New York) Convention is titled, for the first time in the series, the *Proceedings and Debates of the . . . Convention*. The word debates became appropriate in connection with a resolution introduced by a delegate, Dr. Stevens, which in essence would put the Convention on record as subscribing to belief in the non-contagiousness of yellow fever. The proposition brought forth lengthy and sometimes heated discussion and debate.[14] It was voted (seventy yeas to four nays) to amend the original resolution offered by Dr. Stevens to read:

[13] *Ibid.*, p. 17.

[14] President Jacob Bigelow, in addressing the Boston Convention the next year referred to this situation in these words: "Seldom has any professional body, nay, any deliberative assembly in this country, charged even with the control of its greatest interests, brought into the field of discussion such an array of eloquent words, of lucid exposition, of well-ordered and appropriate diction, and of inexhaustible learning, as that which last year marked the assault and defense of the doctrine of the contagiousness of yellow fever."—*Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention* (Boston: George C. Rand and Avery, 1860), p. 17.

Resolved, That in the absence of any evidence establishing the conclusion that Yellow Fever has ever been conveyed by one person to another, it is the opinion of this Convention that the personal quarantine of cases of Yellow Fever may be safely abolished, provided that fomites of every kind be rigidly restricted.[15]

The final vote accepting the resolution as amended was 85 yea, 6 nay; and it was taken twenty-two years before Finlay had promulgated the mosquito vector theory of yellow fever transference, and more than forty years before Reed *et al.* had proved it.

The same man who had championed the relative importance of "internal" as contrasted with "external" causes of disease also had something to say to the Convention in regard to health education:

there is but one ground-work upon which the desired superstructure of law can be certainly and securely based. I mean the education of the people on the subject, and its continual agitation. As a thorough believer in sound republican democracy (in its technical sense) I hold that no amendments in this, as on other subjects, can be satisfactory or safe, without instructions to the legislators, from an instructed people. The masses being those who alone are interested in public health, it is they who must be first moved to demand reform. . . . Clearly the initiative steps for this purpose must be taken by the members of the medical profession; but their labors, when once begun, will not be long unshared by the laymen.[16]

On the evening of the second day of the 1859 Convention, the delegates were guests at a Banquet given by the Common Council of New York City at the Metropolitan Hotel. The Mayor of New York presided; on either side were the mayors of Boston, Providence, Newark and Richmond. According to the *Proceedings*, "Dodsworth's celebrated band discoursed choice music during the evening," and

After the cloth was removed, the Mayor announced The First Regular Toast—'The Great Public Questions involved in the assembling of a Sanitary Convention: the Health, Morals, Happiness and Lives of the People.'

President Griscom responded; and thirteen more toasts followed: the States of the Union, the Municipal Authorities of New York,

[15] *Proceedings and Debates of the Third National Quarantine and Sanitary Convention* (New York: Edmund Jones and Company, Printers), p. 201.
[16] *Ibid.*, p. 240.

Medical Science, Philadelphia, "first in the cause of sanitary reform," Providence, "her success in preventing disease and preserving the health of her people, justifies the name she has," on through most of the other cities represented. The last toast: "Woman—That portion of the human family which most deserves and best appreciates the aid of Medical Science and the offices of kindness." [17]

The Fourth (and as it turned out, the last) National Quarantine and Sanitary Convention met in Boston on June 14 to 16, 1860. Its president was Dr. Jacob Bigelow; eight of its twelve vice-presidents were physicians, the rest were the "Hon Mr. So-and-So." Of the 191 registered members, 118 were physicians; or about the same ratio as the year previous in New York, where there were 113 doctors in 186 members.

Twelve committees were appointed, including one "On Arrangements for the Ensuing Year," "On the Nature and Sources of Miasmata," "On State Medicine," [18] and "On Hours of Labor." It is clear that the organization had every intention of continuing. It is equally clear that its field of interest had enlarged greatly from its original purpose of reforming quarantine laws.

Not a great deal of vital business was transacted at this Fourth Convention. More than any of its predecessors, it seemed characterized by good fellowship and humor. On Saturday, the final day, "punctually at five o'clock" the members of the Convention had dinner at the Revere House as guests of the City Council. Mayors, Governors and literary lights were there, including Oliver Wendell Holmes, in his early fifties, Edward Everett in his middle sixties. Twenty-seven after-dinner speeches were made (there had been fourteen at New York); the first toast was to "Sanitary Science—as illustrated and enforced by the Fourth National Convention of its Friends. May its fruits be for the 'healing of the nations.'" Holmes

[17] *Ibid.*, p. 677.

[18] When Mayor Lincoln of Boston introduced the Governor of Massachusetts (Banks) he said, "When doctors can agree as to the meaning of the phrase 'State Medicine,' may *he* administer it in gentle doses, that it may have the desired effect." *Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention*, p. 124.

responded (with poetry and dry humor) to the toast: "Science, Poetry and Medicine—Never till now united in one person since the days of Apollo."

The cynics and pessimists of our generation can still get a smile from President Bigelow's remarks of that evening:

> Our lot is cast in a perilous age. . . . Where shall we fly to escape from east winds and dog days, from pestilences that come and pestilences that do not come, from ships that bring us yellow fever and quarantines that nourish and cultivate it, from cattle diseases that can only be exterminated by exterminating the cattle, from lead pipes for water contrived to kill everybody except the animacules, from fraudulent food and deleterious physic, from drugs that are poisonous and poisons that are adulterated, from infectious patients whose pulses must be felt with a pair of tongs and their chests explored with a tarred stethoscope?
>
> There are perils of nervous men and nervous communities. . . . Like the amphibious animal of the showman which dies in the water and cannot live upon land, it is in vain that the unhappy inquirer resorts to his statistical tables to inform himself whether there is most danger in a steamboat or on a railroad—he unfortunately learns that the most dangerous thing a man can do is to go to bed, for more people die in bed than anywhere else.
>
> For these evils, and many others yet unknown, we trust that the wisdom of future conventions will yet devise a remedy. . . .[19]

There are no indications in the *Proceedings* that the delegates at Boston sensed the impending national conflict, or the demise of their Convention. They seemed proud of its accomplishments,[20] and confident of its future. They voted "that the next meeting be held in Cincinnati, on Wednesday of the last week in May [1861], and that Dr. Mead of Cincinnati be chairman."

The story of the Quarantine and Sanitary Conventions is a story of origins. Like Peter Pan, the organization never grew up. But twelve years after its last meeting, four men who had attended one, two, or all of the four conventions met in New York with six other

[19] *Proceedings and Debates of the Fourth National Quarantine and Sanitary Convention* (Boston: George C. Rand and Avery, 1860), p. 123.

[20] In the Introduction to the last volume of the *Proceedings* we read: "The transactions of no Association, recent in origin, voluntary in character, and changeable in composition, have attracted more general interest, or been productive of more beneficial results in their effect upon public sentiment and legislative action, than those of the National Quarantine and Sanitary Convention of the United States."—p. 3.

men and organized a new public health association. Three of its first five presidents were alumni of the old Conventions. To use a favorite allusion of Osler's, perhaps the Convention did the Phoenix trick, and, consumed by the fire of war, there arose out of its ashes the great American Public Health Association.

* * *

The story of the rise of the American Public Health Association is relatively well known. Its origins and first five decades were reviewed on the eve of its semi-centennial,[21] and it is today active, articulate, growing. It can, unlike the Quarantine and Sanitary Conventions, tell its own story. It has been and it is a major influence in public health; and directly, through its membership in the National Health Council, and indirectly, through the wide influence of its more than seven thousand members, it has affected the promotional type of voluntary health agency.

" 'Twas the 18th of April— " not of '75, as Longfellow wrote, but of 1872. Ten earnest men from five cities and as many states had met informally in the New York Hotel, New York City. All but one were physicians; the tenth was an architect. One of them, Dr. E. M. Snow, for several years Health Officer of Providence, R. I., had been in attendance at all four of the Quarantine and Sanitary Conventions (1857-1860); another, Dr. Elisha Harris of New York, Chairman of this group of ten, had been a delegate to the New York (1859) and Boston (1860) Conventions, and at the latter had read a nineteen-page paper on " The Utility and Application of Heat as a Disinfectant." A third man present, Dr. Stephen Smith,[22] had been a delegate to the Third Convention (New York, 1859), and a fourth, Dr. John Ordronaux of Roslyn, New York, had

[21] M. P. Ravenel, editor, *A Half Century of Public Health* (New York: American Public Health Association, 1921), 461 pp.

[22] Eleven years later the tenth president of the American Public Health Association, Dr. Ezra M. Hunt, referring in his presidential address to this group of founders, said: " They . . . had a Stephen full of spirit and power, an Elisha wrapped in his mantle of prophetic foresight, a Rauch with good sanitary substance, and a White and a Snow for standard-bearers of a science and an art whose purpose is that cleanliness which well befits personal purity." American Public Health Association, *Public Health, Papers and Reports* (Concord, N. H.: Republican Press Association, 1884), IX: 2.

attended the last Convention at Boston (1860).[23] Others attending the preliminary meeting were the New York architect, physicians from New York, Chicago, and Washington, and another representing the Marine Hospital Service.

Chief action taken at this April meeting was the appointment of a committee to submit at a later date a plan of organization. This Committee on Permanent Organization made its report at a meeting held in the Ocean Hotel at Long Branch, New Jersey, on September 12 and 13, 1872. Representatives of three additional states were present, " active promoters of sanitary work " from Louisiana, Connecticut, and Ohio. At this meeting a constitution was adopted and a president elected. Although the plan of organization was altered slightly at the meetings in 1873, the Association was under way.[24] But of more significance than names and dates and places are the motives and ideas behind them.

Dr. Stephen Smith, the Association's first president, said that

> The American Public Health Association had its origin in that natural desire which thinkers and workers in the same fields, whether of business or philanthropy, or the administration of civil trusts, have for mutual council, advice and cooperation.[25]

The organization's secretary, in an introductory note to the second volume of *Public Health*—Reports and Papers Presented at the Meetings of the A. P. H. A. in 1874-75, wrote:

> The widely extended interest in public health questions, the tendency to sanitary organization, and to various works for the improvement of public

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[23] Three of these four men who had had an apprenticeship in the older Quarantine and Sanitary Conventions became presidents of the newly formed American Public Health Association: Dr. Smith its first (1872, 1873, 1874); Dr. Snow its first vice-president, and its third president (1876); and Dr. Harris, its first secretary, and its fifth president (1878).

[24] President Hunt, in the same address referred to above (footnote 22, *ante*) spoke of the New York and Long Branch meetings, and said of the Association: "With its parentage in the Empire State and its nativity in New Jersey, it added the strength of the one to the true-blue earnestness of the other, and made its outlook upon the ocean the symbol of its breadth of purpose and grandeur of result." *Ibid.*, p. 1.

[25] Stephen Smith, " Historical Sketch of the American Public Health Association," *Public Health*, V: vii.

health of cities and large towns, the recognition of inevitable but hitherto neglected relations of hygiene to social progress and human welfare, and the necessity which is now felt for sound legislation and the organization of competent sources of advice and authority relating to the protection of the public health in the several States, called this Association into existence and now govern its policy.[26]

Dr. Harris had said earlier that the preliminary meetings had been held

with the design to secure concentrated effort, and establish some adequate plans in the cultivation of hygienic knowledge and procure more effective applications of sanitary principles and laws.[27]

This idea is closely paralleled in the statement of purpose as expressed in Article II of the Constitution: "The objects of this Association shall be the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene." [28] In the words, again, of its secretary, the new organization is an "alliance of earnest men in a voluntary system of organized inquiry and conference." Dr. Harris continues:

The reasons for making it a strictly voluntary organization whose autonomy shall not be ever fluctuating or be annually changed and even lost by any system of merely nominal or delegate membership will be obvious. . . . The membership of the Association as provided by its constitution in Article III is secured upon the basis of personal devotion to sanitary studies and their practical applications. The greatly increased interest in sanitary knowledge and its manifold applications, with an enlarged spirit of scientific inquiry which has begun to apply itself to economical and social interests of mankind, already insure a numerous membership and the harmonious working of the Association. Independence of official and governmental relationships the better secures for this body and its beneficent objects the membership and the counsel of the chief promoters of sanitary works and of the ablest contributors to practical knowledge in the leading boards of health.[29]

Thus the men of that day made much of the voluntary nature of their organization, and seemed quite sincere in hoping and expecting that it would be productive of social good. From the fact that all five of its first officers, as well as all six members of the Executive Com-

[26] *Public Health*, II: vii.
[27] *Public Health*, I: ix.
[28] *Ibid.*, p. xiii.
[29] *Ibid.*, pp. ix-x.

mittee were physicians, and that fifty-five out of sixty-nine of those nominated and elected as members at that time were listed as Doctors of Medicine, it can be seen that the Association was launched by and into the hands of the medical profession.[30] The initial membership included two university presidents (Daniel G. Gilman of California University and Andrew D. White of Cornell); Dr. E. R. Squibb, later of laboratory fame, in Brooklyn; and a doctor of philosophy from Montreal.

Naturally, the public health situation had changed since the days of the Quarantine and Sanitary Conventions. Yet "up to this time, no public health organization existed on the American continent, and public health practice, in so far as it existed at all, was empirical and lacked uniformity." [31]

Emerging leadership in the interval since 1860 had come more from cities than from state or national sources.

The Marine Hospital Service, although established by Congress in 1798, was not yet in any sense a federal health department. Shryock, writing of it as of the period about 1850 calls it the "somewhat indifferent Marine Hospital Service," which, in spite of being the only organized federal health work outside of the Army and Navy medical departments,

> curiously enough, devoted itself largely to caring for the mariners of the Mississippi valley. More was left to the energy of unofficial organization, therefore, than was the case in any of the chief European nations.[32]

Not until 1878 was the Marine Hospital Service given authority to impose a quarantine to prevent the entry of disease from abroad, and not until 1890 could it impose quarantine to prevent the interstate spread of disease. Only after the turn of the century (1902)

[30] The first published list of members of the A. P. H. A. is in *Public Health*, Vol. V, and contains 601 names. Of these, 395 or 65.7 per cent, are listed as doctors. The first published list of the members of the National Association for the Study and Prevention of Tuberculosis revealed that 66.3 per cent of them were physicians. The A. P. H. A. has had 68 presidents to 1940, of whom 59 were doctors of medicine, two each were doctors of science, of philosophy, and of public health; one a doctor of laws and logic, and one a doctor of engineering.

[31] Ravenel, *op. cit.*, p. 14.

[32] Richard H. Shryock, "The Origins and Significance of the Public Health Movement in the United States." *Annals of Medical History*, n. s., 1: 647.

was its name changed to The Public Health and Marine Hospital Service.[33] Although Dr. Heber Smith of Marine Hospital Service was one of the ten men who planned the formation of the American Public Health Association, it seems obvious that the latter could not expect much help from national leadership.

Some of the states had a better record. Massachusetts, clearly the leader, had a three-year old State Health Department when the A. P. H. A. was formed in 1872. California's and Virginia's state departments were still younger (1871); and the rest were yet to come. Accurate vital statistics were practically non-existent in 1872.

There may have been good reasons, as Hill believes, why the cities were

> the most active practitioners of a gospel of controlled cleanliness. Their outstanding activity was inevitable. They it was who faced health hazards at their worst. The teeming city block was tinder to the running flame of smallpox or typhoid. Out of sheer terror and suffering the cities grasped first at those opportunities for self-protection which public health practices seemed to offer.[34]

The Association's first president, Dr. Stephen Smith, was city trained. He had been resident physician at Bellevue. His experience in the epidemiology of typhus fever in New York City had lead him to work for and in a survey [35] which brought about the existence of the Metropolitan Health Board in 1866. Smith served as its Commissioner from 1868 to 1875. Thus he brought a background of practical experience in municipal health work to his job as first head of the nation's new voluntary public health association.

The American Medical Association had been in existence for twenty-five years when the American Public Health Association was formed, and it is natural to wonder whether that body as such influenced the creation of the newer group. There was considerable over-

[33] United States Public Health Service, *The Work of the United States Public Health Service*. Reprint No. 1447 from *Public Health Reports* (Washington: Government Printing Office, 1934), pp. 2-3.

[34] Frank Ernest Hill, *Educating for Health* (New York: American Association for Adult Education, 1939), p. 96.

[35] Stephen Smith's book, *The City That Was* (N. Y.: Frank Allaben, 1911), reports the conditions that existed in New York at that time.

lapping of membership, as might be expected, but there were somewhat fundamental differences of interest. The President of the Massachusetts State Board of Health in an "Address on Hygiene and Preventive Medicine" at the International Medical Congress in Philadelphia in 1876 told his audience that the American Medical Association, through its annual meetings and the "frequent intermingling of men . . . from all parts of the Union," had helped forward the cause of public health and preventive medicine in the nation. Then he added:

> It must be confessed, however, that judging from the small number of members attending the Section on Hygiene [at the A. M. A. meetings], that subject seems to afford less interest than any others.[36]

If it is reasonably safe to judge men's interests by what they speak and write about, the first ten volumes of the Association's reports and papers, entitled *Public Health*, afford the best clues to the real interests that concerned the members of the organization in its early formative years. On this theory it seems justifiable to give some little attention to the contents of these early volumes.

President Smith addressed the membership in 1873 "On the Limitations and Modifying Conditions of Human Longevity, the Basis of Sanitary Work."[37] The President of Columbia College, F. A. P. Barnard, LL. D., reported on "The Germ Theory of Disease," and in reviewing the evidence in favor of the theory, he admitted that it must be "at least partially true." As a consequence of its implications, Barnard said,

> the study of the laws of hygiene is assuming in our time, in the estimation of the public and of the profession themselves, an importance which places it above even the proper business of the profession . . . Therapeutics.[38]

This is hardly in agreement with the opinion that Dr. Bowditch expressed three years later, as quoted above.

There were at the 1873 meetings fifteen papers on cholera, including a report of an epidemic of that disease of that very year in Ken-

[36] Henry I. Bowditch, *Transactions of the International Medical Congress* (Philadelphia: n. n., 1877), p. 29.

[37] It is interesting, if not strictly pertinent, to note that this speaker on longevity himself lived to be 99 or 100.

[38] *Public Health*, I: 87.

tucky; there were five papers on yellow fever, five on quarantine, and one each on vital statistics, disinfection, and water supply. Other reports dealt with "The General Causes of Disease," "The Longevity of Brain Workers," "History and Course of the Epizootic Among Horses in the North American Continent, 1872-1873," "The Relation of Race and Nationality to Mortality in the United States," by the Superintendent of the Ninth United States Census; and one paper modestly purported to expound the "Relative Influence of City and Country Life on Morality, Health, Fecundity, Longevity and Mortality."

While it is probable that the members who attended the 1873 meetings [39] were much better informed than the men who had attended the last National Quarantine and Sanitary Convention in Boston in 1860, since the intervening decade had been a fruitful one in science and medicine, a comparison of the topics discussed indicates that both groups were interested in very much the same things.

Sustained interest in epidemic diseases is understandable, since they represented the most direct challenge to the health officer (or sanitarian, as he was called in the 1860's). Yellow fever was of perennial interest, and reached something of a climax with the widespread epidemics of 1878. To some future researcher is commended an investigation of the Association's part in the whole struggle against this disease. He will learn not only that yellow fever was a subject for committee study and for active discussion and debate at annual meetings, but that members of the Association were influential in importuning Congress to establish the National Board of Health, which for four years [40] functioned as an emergency yellow

[39] The two 1872 meetings were considered preliminary, and both the First and Second Annual Meetings were held in 1873, the one in Cincinnati on May 1-3, the other in New York on November 11-14.

[40] As early as the Long Branch meeting in 1872, a charter member of the Association, Dr. C. C. Cox, of Washington, presented the draft of a bill which he wished the Association to present to Congress for the establishment of a sanitary bureau as a part of the Interior Department. Cox was made chairman of a Committee on the Necessity of a National Sanitary Bureau. After hearing the report of this Committee in May of 1873, the Association passed a resolution endorsing such a bureau. The Association hoped for a permanent Board or Bureau, not the temporary body that was created.

fever commission, then was allowed to expire for political reasons.[41] When in 1880 the Association ventured to hold its annual session in New Orleans, the Secretary remarked on the freedom from yellow fever the city then enjoyed, credited it largely to "the work of this Association and its child, the National Board of Health," and said that for the first time in four years yellow fever failed to absorb the main interest of the session. Carlos Finlay, Cuban physician who proposed the mosquito vector theory of the transmission of yellow fever nineteen years before Reed *et al.* had proved it, was the Association's thirty-second president.[42] And the thirty-eighth president, Dr. Charles O. Probst, said in 1910:

> It was this Association, through its committee on yellow fever, which induced President McKinley to bring the matter of its investigation before Congress, and paved the way for the wonderful work of Reed and his associates—members of this Association—who, in discovering the true cause of this dreaded pest, have freed Cuba from a worse fate than Spanish domination.[43]

Scarlatina came in for occasional discussion, and dengue or breakbone fever was reported upon by three speakers in 1880. Two papers were read on malaria in 1881 and six in 1883, and a paper on "Sewer Gas as a Cause of Diphtheria and Typho-Malarial Disease" was read just a few years before the specific etiology of diphtheria and typhoid became known. At a time when the causes of the venereal diseases were unknown, Dr. F. R. Sturgis said that "syphilis can only produce syphilis; it cannot produce phthisis any more than it can measles."[44] There were three papers on trichinosis and *Trichina spiralis* at the 1881 session.

Yet by no means was the early Association occupied exclusively with the communicable diseases. President Griscom had stressed the intrinsic importance of "internal hygiene"[45] at the Third Sanitary Convention in 1859, and the early records of the American

[41] Robert D. Leigh, *Federal Health Administration in the United States* (New York: Harper and Brothers, 1927), p. 473.

[42] When the Association's Annual Meeting for 1904 was held in Havana, Cuba, in January of 1905.

[43] *Public Health*, XXXVI: 2.

[44] *Ibid.*, II: 446.

[45] *Cf. ante* p. 409.

Public Health Association vindicate his appraisal. Water supply, abattoirs, tenements, the sanitary regulation of factories, the dangers of illuminating gas, the sanitary safety of railway carriages, the prevention of insanity, the prevention of suicides and the proper disposal of the dead are each the object of some member's concern. The "Perils of the School-Room," and other papers on school hygiene, on nervous diseases among school children, and on "schoolroom stunting" appear as early as 1875; and in 1877 there was a small outburst of papers on higher education: "Hygiene at Amherst College," by Professor Hitchcock, "Hygiene and Higher Education," by President Gregory of Illinois Industrial University, and a third on "Female Physical Culture at Ann Arbor College." There is a foretaste of safety education in the report on "Protective Spectacles for Working Men," in 1884, and of consumer education in "The Adulteration of Beer" and "The Food We Eat, The Liquids We Drink, and The Adulterations We Submit To," at the same session.

There are, of course, naive and interesting titles, like the Hon. L. H. Steiner's on "A Sanitary View of the Question, 'Am I My Brother's Keeper?'" and Stephen Smith's discussion of "Physical and Moral Causes of Bad Health in American Women." Yet the annual volumes of *Public Health* testify to a diversity of interests, some of which seem quite modern. They show, in the main, a practical and down-to-earth grasp of medical and socio-medical problems, tinged with optimism and the firm belief that science—especially sanitary science, as it was then called—could do wonders. They provide a significant running commentary on the times, so far as public health is concerned. For an example, President Kedzie at the Tenth Annual Meeting in the fall of 1882, rejoices in Koch's discovery of the tubercle bacillus, and in the recent increase in state boards of health, but is discouraged by the "hostile indifference of Congress and the Executive to the National Board of Health." [46]

The early American Public Health Association had a major interest in the establishment of more—and better—boards of health, state and local as well as national. At the Philadelphia meeting (1874) it was resolved, on the motion of Dr. H. Earnest Goodman, that the

[46] *Public Health*, VIII: 9-11.

Association urge upon the governor and the legislature of "each and every state in the Union," the importance of enacting laws creating state boards of health and providing adequately for sanitary administration within the state. Copies of the resolution were sent to all executives and legislative bodies.

At the time the Association was founded, a standing committee on State and Local Sanitary Organization was formed. In January of 1875 this Committee submitted to the Executive Committee "An Act to Establish a State Board of Health and to Assign Certain Duties to Local Boards of Health." The Executive Committee approved it by passing this resolution:

> *Resolved*, That a copy of this report be forwarded to the executive and legislative authorities of all the States, together with a recommendation that health officers be appointed and Boards of Health be organized in all counties, towns, and cities throughout the States, to cooperate with the said State Boards.[47]

Gist of the suggested act, so far as states were concerned, was that the governor would be authorized to appoint six persons, three of whom were to be physicians, to constitute, with the attorney general, the state board of health. These men were to serve six year overlapping terms, with expenses allowed but with no other compensation, and were to meet quarterly, to collect vital statistics, to have certain powers, and to make an annual report.

President Snow, in 1876, reviewed the progress in public health, not so much, he said, in new knowledge or principles gained, as in the creation of organized boards of health, especially state boards. Snow said that much of the work of the Quarantine and Sanitary Conventions was "practically rendered useless" by the "influx of *ex officio* Boards of Health composed of politicians and others entirely ignorant of sanitary science."[48] Just why boards currently appointed by governors would be any better at the time Snow was speaking was not made clear; and his optimistic statement that now "most of our cities and some of our states have Boards of Health qualified for their duties" is a report of progress not fully substantiated by other evidence.

[47] *Ibid.*, II: 526.

[48] *Ibid.*, III: 222.

There were laymen in the Association in its early years, and some of them were put to work almost immediately. At the second preliminary meeting in 1872, some twenty special committees were named. A landscape architect, Fred Law Olmstead of New York, was made chairman of a committee On the Sanitary Value and Uses of Shade Trees, Parks, and Forests. Professor C. F. Chandler, also of New York, was named to head a committee On the Practical Applications of Chemistry to Public Hygiene. Carl Pfeiffer, architect and charter member, was assigned to report On Sanitary Principles and Their Requirements, Applied to Public Edifices and Private Residences. There were committees on meteorology and climatology, and a Californian was instructed to study The Influence of the Production and Use of Native Wines Upon the Vice of Intemperance and Upon the Public Health.

Many members of the American Public Health Association in 1943 may be surprised to learn that at one time their organization was dissolved and—momentarily—ceased to exist. Article XI of the original constitution called for a quorum of twenty-five members for the election of officers, for any change in the constitution, for the election of new members or the appropriation of money. Only seventeen members attended the opening session of the First Annual Meeting in Cincinnati (May, 1873); and when, on the second day of the Second (New York) Meeting that fall a roll-call failed of a quorum, "and the same difficulty having occurred at all previous meetings since the organization of the Association," on the motion of Dr. Woodward the Association was dissolved and adjourned *sine die*.

It was then resolved that the members "of the late Association" proceed to form an organization to be called the American Public Health Association. Dr. Stephen Smith was made chairman, Dr. Harris, secretary *pro tem*. Dr. Woodward moved that a committee of three be appointed to draft and report a constitution. With alacrity the committee reported what was virtually the old constitution, with (among minor changes) an Article XI providing for a quorum of nine to transact business. The same officers were re-elected, and the treasurer was directed to assume "all pecuniary

liabilities of the late Association." [49] Thus was established further evidence of the ingenuity and resourcefulness of these pioneers in public health.

Membership had been five dollars a year from the start. The treasurer's report for October 4, 1874, said, in part:

> The proportion of members paying dues has steadily declined since 1873. Of members on the roll, about two-thirds paid dues during the first two years, less than one-half paid during the third year, and, for the year just closing, less than one-third have paid membership dues.[50]

It is possible that this condition reflects more the wide influence of the panic of 1873, and the five years of hard times which were its aftermath, than it does any cooling of professional ardor. It can at least be shown that business was better with the American Public Health Association at about the time the country at large was recovering from that depression. Nearly four hundred persons attended the New Orleans meeting in 1880, and President J. S. Billings said at that time, speaking of the Association, that " its financial condition is now very satisfactory." By the time of the Savannah meeting the next year, membership had reached seven hundred.

This is a study of origins, and such details as have been given of the first years of the American Public Health Association have been included for what light they can throw on the men who formed this voluntary health agency: on their interests and motives, their activities, the times in which they lived and worked. This study leaves untouched that longer and equally fascinating period in the Association's history *since* the 1880's. There are new problems, new leaders, and new opportunities, new services rendered. There is the affiliation of members from Canada, Mexico, Central America, Cuba; there are new sections, to bring together those with specialized interests in the ever-broadening public health field: Bacteriology and Chemistry, Vital Statistics, Public Health Administration, Public Health Education and others. There are the very important standard methods and uniform practices as worked out by A. P. H. A. committees: for the examination of water and sewage, for

[49] *Ibid.*, II: 539.

[50] *Ibid.*, III: 220.

the bacteriological examination of milk, for the pasteurization of milk, the model health code for cities, the standardization of public health training. There is, beginning in 1911, the *Journal*. These things speak for themselves.

When the Association was seven years old, its first president wrote this paragraph, which is as true in 1943 as it was in 1879:

> Beneficent as has been the work of the Association, and important as are the reforms which it has achieved, it can but be in the infancy of its usefulness. However perfectly our system of public health service may become organized there will always be need of consultation and cooperation among those devoted to official duties, as also the discussion of theoretical and practical subjects by sanitary students.[51]

[51] *Ibid.*, V: liii-liv.

STUDIES ON MORTALITY SINCE THE RENAISSANCE

SIGISMUND PELLER

A. General Mortality of Women.

Age and sex specific mortality rates are known for only short periods of time. The few countries with the longest record, Sweden (1), Norway (2), and England (3) permit observations for one to two centuries. Records of several cities for some periods of the 18th century have been studied by contemporaries (Chr. Kundmann, J. P. Süssmilch, Wargentin, Déparcieux, W. Black, Th. Short, etc.) (2), and in more recent times (A. Gottstein, K. Kisskalt, Ch. Singer, S. Peller) (4). Lack of suitable census data and incompleteness of the reports in most places impede evaluation: still more scanty and vague is the knowledge concerning the 17th or 16th century. Only London and Leipzig for some periods of time preserved data—the former without age specification—which gained historical importance (J. Graunt, C. Neumann and E. Halley) (2).

As to these early and still earlier times, one source of information, data preserved in the archives of ruling families, has not been sufficiently related to demographic problems. Genealogical material mostly was studied from the point of view of family or heredity (Swedish nobility by P. E. Fahlbeck (2), and peasants by H. Lundborg) (5), or for determination of the unvoluntary portion of human sterility (E. H. Kisch (6) and others). Sometimes genealogical samples were also used for the calculation of age specific mortality rates (Danish nobility by G. Bang (2), ruling families by H. Westergaard (2) and Fr. Prinzing (7)).

Usually mortality of ruling families is lower than that of the total population. A study of these families means therefore the determination of boundary values for the respective time. A comparison of such values with the achievements of the present time is of scientific interest. Moreover, as will be shown here, in some age groups ruling families were worse off than low nobility was or than peasants were. Apparently some of the court customs and obligations

counteracted the influence of the best environmental conditions of the period, of good nutrition, best obtainable housing, leisure, personal hygiene, medical care and isolation in times of epidemics. To learn the favorable and the adverse effects may prove useful for the study of some present day problems.

The earlier the century, the less complete is the genealogical material with regard to the females' birth day. It was advisable, therefore, to limit the analysis to persons who died since the year 1500. For collection of data I rely upon the comprehensive genealogical work of Wm. K. Isenburg (8) which covers all ruling families of Europe. This work enabled us to carry out a study on a far wider scale than was possible until now. Additional information was obtained from Gothas Almanach.

In this paper the mortality of 2,848 women will be analyzed, of whom 61 were younger while all other were older than 15 years of age. In other papers puerperal mortality, mortality of men and of children up to puberty age (incl.) will be dealt with.

The Wedding Age of Women.

Altogether data of 2,099 women married from the year 1500 up to 1899, have been scrutinized. In 233 cases the age at marriage is unknown; the majority of them occurred in the 16th century. In 12 cases, the bride was over 50 years of age.

TABLE 1

WEDDING AGE OF WOMEN *

Age at marriage	Married in 1500-1599	1600-1699	1700-1799	1800-1849	1850-1899
10–14	27	16	15	3	—
15–19	152	162	193	76	73
20–24	93	180	162	98	122
25–29	39	97	70	37	37
30–34	12	37	26	11	22
35–39	4	27	18	8	6
40 +	4	15	14	6	4
?	136	68	20	4	5
all age groups	467	602	518	243	269

* Only the woman's first wedding has been considered here.

Mostly, women married at the age of 15-24 years. In the 16th century, of the brides 8% were as young as 10-14 years. Later, the corresponding value diminished, and after 1850 the puberty age disappears from the age table of brides. In the 16th century, of all brides of known age, 54.1% were less than 20 years old; in the following 4 time periods (see Table 1) the percentage diminished to 33.3, 42.2, 33.3 and 26.4%, respectively. The average age of the brides in the 16th century—20.2 years—was lower than in following centuries, when it was as high as 22.7, 21.7, 22.2 and 22.5 years, respectively.

Of those who were wed (for the first time) in the 15th century 25% married a widower or divorcee. This percentage dropped over 22% and 20%, respectively, in the next two centuries, to 15% in the second half of the 19th century.

Death of Married Women within the Reproductive Age.

During the time under investigation, the risk of dying within the reproductive age was diminishing with ever increasing speed. Of those who married in the 16th century, 48.5% died before having reached the 50th birthday; in the following four periods the corresponding values were 42.3, 36.3, 29.1, and finally 17.4%. For women who married in the second half of the 19th century, the risk of dying before the age of 50 years, was about ⅓ the risk of women who lived and married in the 16th century. The reciprocal values e. g. the survival rates rose from 51.5% in the 16th century to 82.6% for women who married in the second half of the 19th century. This indicates a diminished number of young orphans and a stabilization in family life.

Not all age groups shared the improvement in death rates to the same extent. Women 15-24 years old did not participate in the decline of mortality. The improvement is limited to the age groups above 25, and is more outspoken in the 5th than in the 4th decade of life.

The inequalities in improvement resulted in a peculiar shape of the age curve in women who married in the second half of the 19th century. In the 16th and 17th centuries the risk of dying increased from age to age group. The losses of life were then tremendous; by

GRAPH I.

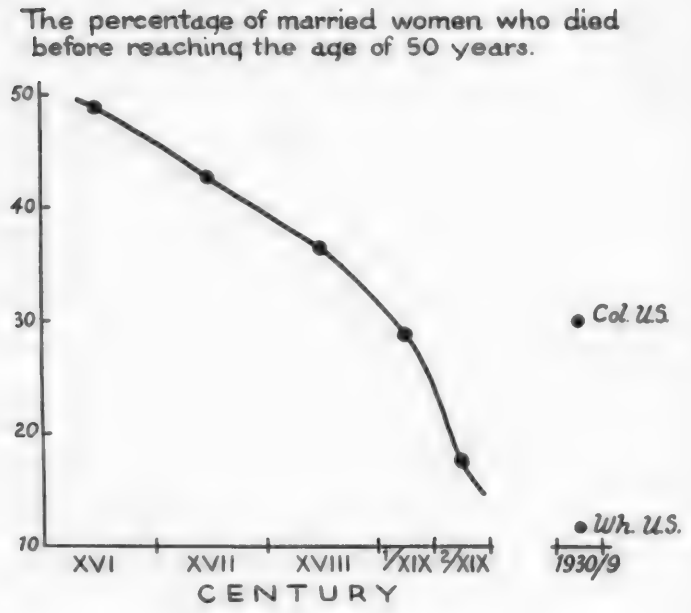


TABLE 2

NUMBER OF DEATHS AMONG WOMEN

Age at death	1500-1599	1600-1699	Married in 1700-1799	1800-1849	1850-1899
15–19	6	1	8	2	3
20–24	16	17	31	10	8
25–29	25	34	30	10	7
30–34	20	42	29	14	9
35–39	28	44	25	13	5
40–44	33	51	25	10	8
45–49	32	38	32	9	6
15–49	160	227	180	68	46

TABLE 3

AGE SPECIFIC TOTAL MORTALITY OF WOMEN (IN %)

Age at death	Married in 1500-1599 %	1600-1699 %	1700-1799 %	1800-1849 %	1850-1899 %
15–19	3.34	0.56	3.84	2.53	4.11*
20–24	6.01	4.45	8.56	5.71	4.16
25–29	8.65	7.43	7.50	4.95	3.12
30–34	7.25	9.33	7.30	6.90	3.81
35–39	10.77	10.48	6.47	7.11	2.14
40–44	14.10	12.78	6.77	5.40	3.45
45–49	15.84	11.33	9.22	5.08	2.67

* Three deaths of childless women at 18, 18 and 19 years of age, after 5 months, 1 and 2 years of marriage, respectively.

passing through the age group 40-44 or 45-49 years respectively, one ninth to one sixth of the cohort died. In due time the dangers for women over 30 years of age diminished to such a degree that women who married in the second half of the 19th century, had lower death rates between 30-49 years of age than in the age of 15-24 years. (See Table 3.)

The figures of Table 3 represent the total loss among 100 women while passing through the respective age group. In each age group the cohort consists of two different categories of women: a) those who were already married in the adjacent lower age group, and b) the newly married. On the proportion of a: b depends the average number of years the cohort of married remained in the respective age group. This average is smaller in lower and larger in higher age groups. To make the age specific death rates more comparable with each other, the values of Table 3 were divided by the corresponding number of years. The resulting annual mortality rates are given in Table 4.

The details previously mentioned are here more emphasized. In the 16th and 17th centuries the annual age specific mortality rates do not rise as steeply as did the rates in Table 3. On the other hand, in women who married 1850-1899, the contrast between the high

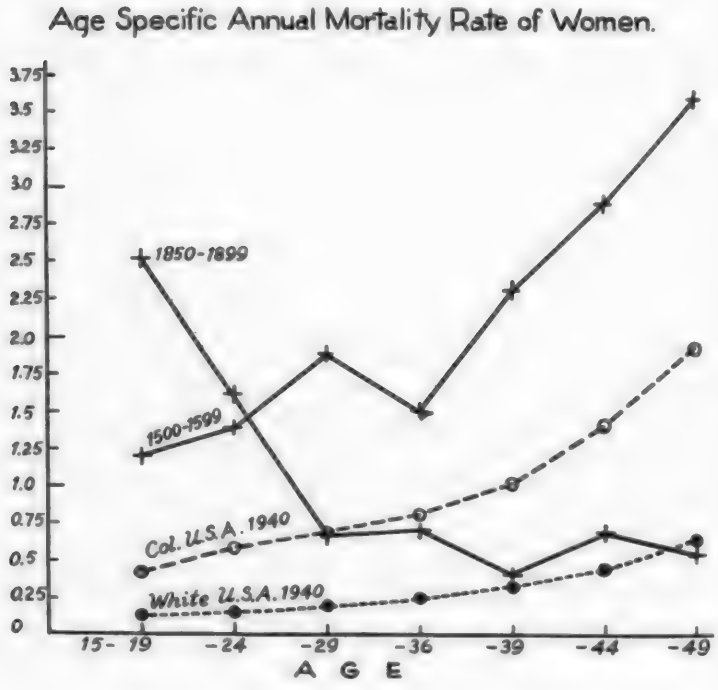
TABLE 4

ANNUAL MORTALITY RATES OF WOMEN (IN %)

Age in years	Married in 1500-1599	1600-1699	1700-1799	1800-1849	1850-1899
–19	1.2	0.20	1.53	1.29	2.52 ± 1.8 *
20–24	1.4	1.13	2.25	1.54	1.62 ± 0.9
25–29	1.9	1.73	1.70	1.10	0.68
30–34	1.5	2.07	1.55	1.47	0.72
35–39	2.3	2.25	1.35	1.58	0.43
40–44	2.9	2.78	1.41	1.11	0.70
45–49	3.6	2.37	1.97	1.05	0.54

* See footnote to Table 3.

GRAPH II.



mortality of the two youngest age groups and the low of the age groups 25-49 years is stronger than the former table indicated. In the most recent cohort, of women below 24 years of age, 2.5 and 1.6%, respectively, died annually, while in the higher age groups, between 25 and 49 years, the corresponding losses were only as high as 0.4 to 0.7%.

A comparison of Table 4 with the data obtained by Prinzing * and Westergard ** shows that Prinzing's figures are close to ours while Westergaard's values are more favorable, especially in the lower age groups. According to Westergaard, in the 18th century in the age groups 15-19, 20-24, 25-34, and 35-44 years, there died annually 0.95, 1.1, 1.3 and 1.0%. Westergaard's sample contains also unmarried women. This, however, does not seem to be the explanation of the discrepancy. How far gaps in Westergaard's material were responsible, I do not know.

Ruling Families and the General Population.

In the first half of the 19th century the female general population of Norway and Sweden had lower mortality rates than were shown in Table 4. In Norway in 1801-05, of 100 women between 20-30 or 30-40 years, 0.8 and 1.15, respectively, died annually. In Sweden the corresponding values for the years 1816-1840 were 0.6 and 0.9%, while in the ruling families for women who married 1800-1849, and died then or after 1850 in these age groups the annual death rate was not lower than 1.3 and 1.5%. Not so great are the differences if our figures are confronted with England's earliest data (1841-1850); in the age groups above 25 the differences are negligible, while in the age groups 15-19 and 20-24 our figures are 1½ and 1⅞ times, respectively, higher than those compared with.

In Table 5 the mortality rates of the high aristocratic women married 1850-1899 have been compared with Germany's and England's mortality rates for 1871/90 and with U.S.A. figures for 1940.

* German high nobility, 1500-1699; 700 women over 10 years of life. Unfortunately, rates were calculated per life decades.

** 619 women of ruling families, over 15 years of age; 1700-1881.

TABLE 5

ANNUAL MORTALITY RATES PER 100

Age in years	Ruling families; women married in 1850-1899		Germany Women 1871—1890	England & Wales Women 1871—1890		United States 1940 Women	
						Colored	White
	Column A		Column B	Column C		Column D	Column E
15–19	2.50	1.40	0.47	0.50		0.42	0.12
20–24	1.16		0.64	0.61		0.59	0.16
25–29	0.68		0.81		0.80	0.70	0.20
30–34	0.79		0.95			0.82	0.25
35–39	0.43		1.07		1.10	1.05	0.32
40–44	0.69		1.14			1.40	0.45
45–49	0.53		1.26	1.41		1.92	0.65

Again the most startling feature is the high mortality of the 15-24 year old women of the ruling families. Since for these two age groups also former periods (out of five periods four) were unfavorable, one should not neglect the actual figures in spite of the smallness of the observed population.

Entirely different is the situation in the age groups above 24 years. The higher the age group in Table 5, the more are the mortality rates of Column A surpassed by those of the contemporaneous German and English population (Columns B and C) and by the mortality of the Negroes in the U. S. A., in 1940 (Column D). In this comparison the time factor has to be clearly realized. Women of Column A, married between 1850 and 1899, on the average, at the wedding were 22.5 years old. Those who passed away at the age of 35-49, on the average died about ½-⅓ century earlier than Negro women who died in 1940. During these 3.5 to 5 decades, enormous medical, social, political and technical development occurred, especially in this country, lowering the mortality level of all strata of the population. However, not all strata of the population equally benefited from the progress. Thus, in spite of the interval of 35 to 50 years, Negro women have still higher mortality rates than those of Column A.

The tremendous progress in saving life achieved during the last 3½ to 5 decades is more clearly indicated in the comparison of Column A with Column E, e. g., with white women (of the U. S. A.) who died in 1940. However, here also it has to be realized that the time had not the same meaning for all age groups. Above the age of 34 years, the progress dwindles more and more, and finally disappears. For these age groups, the great achievements in medicine evidently were counteracted by some other environmental factors. This is by no means a matter concerning solely this country. One arrives at similar results by comparing women of the ruling group with the female population of Norway and Sweden.

Mortality of Childless Women, Married and Spinsters.

Of women who married in the 16th or 17th century and remained childless, there died below the age of 50 years 46.9%; the corresponding values for the 18th and 19th century were 34.3 and 26.5%. All these values differ but little from and partly are higher than the total mortality of fertile women, inclusive puerperal mortality, which —as is shown in another paper—accounted for ¼ to ⅓ of all of their deaths below the age of 50 years.

The mortality rates of sterile women were especially high in the age below 20. In the other age categories, between fertile and sterile women there are only insignificant differences in mortality. Thus, the conclusion must be arrived at that the conditions of health of sterile women were poorer and that the general poor health accounted at least for a part of their childlessness. This factor was not sufficiently considered by authors who studied the sterility ratio in the high aristocracy with the purpose of determining the biological portion of sterility in the general population.

Not so clear is the relationship between health and celibacy. Certainly health played some role among the various reasons for a continuation of life as spinsters. Besides the 2,099 women who married between 1500 and 1899, I collected from the lists of ruling families data for 749 women who were born in the years 1480 to 1879 and died as spinsters at recorded age (since the year 1500).

The annual age specific death rates for all those who regardless of their civil status in later years in the respective age year were

spinsters, are much lower than the corresponding values of married women. (Compare the right side of Table 6 with Table 4.) In the higher age groups of the reproductive period of life the differences are less outspoken.

In the left side of Table 6, representing women who never married, the mortality rates are much more unfavorable especially in the two lowest age groups. Here are those spinsters concentrated whose marriage was prevented by bad health and death.

TABLE 6

ANNUAL MORTALITY RATES (IN %) OF SPINSTERS

Age in years	Women who never married, Born in 1480-1679°	1680-1779*	1780-1879**	All women who either remained spinsters or married later, Born in 1480-1679	1680-1779	1780-1879
15–19	2.82	1.78	3.68	0.88	0.65	0.79
20–24	2.01	0.97	1.50	0.98	0.49	0.44
25–34	1.81	1.48	1.57	1.31	1.13	0.91
35–44	1.65	1.56	0.72	1.55	1.48	0.69
45–49	3.43	0.86	1.53	3.35	0.84	1.42

° 407 spinsters.
* 225 spinsters.
** 117 spinsters.

The Mortality in Higher Age Groups.

Above 50 years of age, the annual mortality rates were increasing with rising age. The increase became stronger in course of time.

During the centuries under study, the mortality rates of women above 50 years of age improved to a lesser degree than was demonstrated for the ages of 35-49 years.

The values calculated for the 18th and 19th centuries are more favorable than those found by Prinzing and Westergaard.

In the course of four centuries, the mortality rates of 50-54 and 55-59 year old women of the ruling families declined by as much as ¾, or even ⅘, and reached a level (Column E: 0.8 and 1.0%) more favorable than that which white (1.0 and 1.4%) or colored women (2.6 and 3.1%) in the U. S. A. have been able to achieve in 1940. In still higher age groups, however, white American

women already surpassed the level of the Column E. In the U. S. A., in 1940, women 60-64 years old had an annual mortality rate of 2.2% (white) and 3.7% (colored), respectively, as against 3.2% in the ruling families (Column E). In the age group 65-69 years, the corresponding values were 3.5 and 4.7% for the U. S., against 4.3% * in Column E.

TABLE 7

ANNUAL MORTALITY RATES OF WOMEN (IN %)

Age in years	Of ruling families married in 1500-1599 Column A	1600-1699 Column B	1700-1799 Column C	1800-1849 Column D	1850-1899 Column E	Of U. S. A., 1940 Colored Women Column F	White Women Column G
50-54	2.95	2.42	2.45	1.71	0.84	2.62	0.95
55-59	5.60	4.73	2.91	3.46	1.04	3.16	1.42
60-64	8.65	6.11	4.37	3.59	3.24 *	3.68	2.21
65-69	6.95	9.86	5.58	3.71	4.32 *	4.64	3.53
70-74	13.10	10.05	9.45	6.81	5.61 *	6.01	5.62

* The definite values will be smaller.

The gain in longevity since 1500 is tremendous. Of 100 women 50 years of age who had married during the first 350 years under investigation, in the four consecutive periods as many as 15.2, 18.3, 28.7 and 37.6 survived the 75th year of life, and 7.6, 8.0, and 16.1 and 25.1%, respectively, survived the 80th year of life. Of those 50 year old women who married 1800-1849, not less than 8.2% survived the 90th year of life.

In the 16th and 17th centuries the high mortality of married women of 15-49 years of age did not have any selective influence upon, and protective value for, the survivors of the reproductive period. In the 19th century, women over 50 years of age, had a favorable mortality in spite of lower losses in earlier age groups.

As to the spinsters of 50 years of age, 22.4, 16.4, 18.4 and 42.4, respectively, survived the 75th birthday, and 10.4, 6.9, 11.8 and 24.2%, respectively, the 80th birthday.

* In these high age groups the final values for the nobility will be somewhat more favorable than in Table 7 which is based on observations until 1935 when a considerable percentage of persons over 55 years of age were still alive, and therefore excluded from calculation.

Considering the relatively small number of observations in these high age groups the differences between the survival rates of married and unmarried women do not indicate any superiority in living conditions or in the constitution and resistance of any one of the two groups of women.

Discussion.

The most unusual feature, unexpected and disclosed in the study is the high mortality of women of 15-24 years of age. This feature became more pronounced the more the conditions improved for all the age groups above 24. Throughout the 400 years, the conditions of life were and remained unfavorable for adolescent girls and young women of the ruling families. Perhaps the habits of dressing combined with lack of sufficient mobility, exercise and play in the open air may have been responsible for this. The customs were influenced by the Spanish ritual in the court of Charles I where the female body was covered up to the wrists, chin and feet. Beneath the bodice, fastened with hooks and eyes, corsets with a stiffening of whale-bone were worn. This compressed the waist to the utmost. "Girls had to wear this corset from a very early age. It not only constricted the waist . . . it pressed the breast up . . ." (Coehler) (9). In Spain even sheets of lead were fastened over the breasts of young girls in order to retard the development. After farthingales were ousted, (8-10) petticoats covered the body beneath the heavy material of which the garments were made. Children, says Mary Evans (10), shared with their parents the discomforts of ruff, stiff heavy corset, hoop and padded doublet. Those children could not enjoy bodily exercise like children of the low classes. In the 17th century ladies started to wear face masks on the streets, not for chastity but to protect the skin from the tanning action of sun rays. The custom persisted for about 100 years only, but until the last half century other means were employed to avoid the healthy influence of ultraviolet rays.

Rousseau's pledge for the rights of childhood was first without effect. It took a long time before the middle classes abandoned the stiff corset. In the conservative air of the courts, however, old customs persisted much longer. No wonder that under such circum-

stances the development of the female body was restricted and the health jeopardized.

Forty to fifty years ago, girls of the middle classes, although far less exposed to these damaging habits than were formerly court members, suffered enough to be underdeveloped, chlorotic and anemic. Falsely, this state of health was considered inevitable. In the last decades changed habits together with other environmental influences disproved this theory. Thirty to forty years ago white women were considered unable to stand the tropical climate. Changed customs in dressing proved during the last 20 years that they are able to live and even to work under tropical and sub-tropical conditions. It is most probable that the above mentioned old court customs had far more deleterious effects, and diminished the resistance of the young female body to various diseases. The ill effects were still visible at the time when for women above 25 years of age the situation changed substantially to the better.

Considering the development in the age specific mortality rates throughout the 400 years, one is reminded of the effect of tuberculosis upon women 15-24 (-29) years of age during and following the first World War. In spite of the improved general conditions after 1924/25 the tuberculosis level of women 15-24 years old remained high, while in lower as well as in higher age groups the level yielded and decreased much more. Thus, as I have shown for 1929 in Vienna (11) and as it was later shown for other European cities and countries, a peculiar shape of the age curve resulted; a high peak between two deep valleys (5-14 and 30-59 years, respectively).

The mortality curve of European ruling families in the most recent period of our study resembles very much this tuberculosis curve, exemplifying the rule that the young female body is more sensitive to damaging environmental influences than are other age groups.

Summary and Conclusions.

1) This is the first of a series of papers on births and deaths, since the year 1500. In this part, an analysis of the mortality of 2,099 women married from 1500 up to 1899, and of corresponding 749 spinsters, all over 15 years of age, is given. The 2,848 individuals were members of the ruling families of Europe.

It is the biggest sample of this kind ever studied, and it permits generalizations applicable to the total population.

2) In the 16th century, of women of 15 years of age 50% reached the age of 50 years, and 9% only were alive at the age of 75 years. In the general population, the situation presumably was still worse. In the U. S. A., in 1930-1939, the corresponding values for colored women were 67 and 24%, for white women 87 and 57%, respectively.

3) As early as the 17th century the mortality was declining. Starting long before the scientific era in medicine, the improvement went on accelerated throughout the centuries. The highest degree of improvement is shown by 35-49 year old married women; in 1850-1899, of the mortality rates of the 16th century ⅘ to ⅚ were eradicated. The second place is taken by married women of 50-59 years of age, while the age groups 25-34 and over 60 years occupied the third place. The age of 15-24 years did not participate in the improvement at all.

4) Women of ruling families married 1850-1899 had higher death rates at the age of 15-24 a) than at the age of 35-59 years, and b) higher than the general population of the same age group, in progressive countries. Explanation is sought in court habits—clothes, seclusion, lack of open air activity—detrimental to the development of the female body.

5) For married women, in the five consecutive periods, the survival rates at 50 years of age were: 51, 57, 64, 71 and 83%, respectively; of those alive at 50 years, in the first four consecutive periods: 15, 18, 29 and 38%, respectively, were still alive at the age of 75 years. The decline in mortality below the age of 50 a) did not have contraselective influence upon the death rates in higher age groups, and b) increased the stability of family life by reducing the number of prematurely dissolved marriages and of children left orphans.

6) During the four centuries under scrutiny, the mortality of spinsters below the age of 50 years improved less than that of married women. Since the 18th century the ratio of spinsters to all women was strongly diminishing, indicating an increasing negative selection from the point of view of health in the group of women

who remained spinsters, and most probably explaining the slow progress in the mortality level. Spinsters over 50 years of age do not share with younger spinsters the unfavorable health position.

7) In the U. S. A., in 1931/39, the survival rates of the white female population are more favorable than the rates calculated for women of the ruling families, married in 1850-1899. The survival rates of the colored population are lower.

B. Maternal Mortality.

The term maternal mortality, as used in this study, includes all deaths which occurred within a range of two months after the termination of pregnancy. It was not taken into account whether death resulted from a specific complication or was only associated with the delivery in time.

Usually, the latter category of deaths adds but a few percent to the specific component of maternal mortality, since from the point of view of health pregnant and puerperal women represent a favorable selection. Even if the time has not been limited to the first two months after delivery but is extended to the whole calendar year—as is the official procedure in England and Wales (12)—the death rate due to the non-specific component of maternal mortality is only ⅓ of the annual mortality of all women of the same age groups. Save in times of epidemics, in the first two months, and especially in the first month after delivery, almost all deaths are due to specific complications of pregnancy and delivery.

For the quantitative analysis of maternal mortality it is of minor importance whether the dividing borderline is set at one or at two months. Some of the puerperal deaths may occur in the second month or even later. Therefore, if classification is not based upon diagnoses, the two months' time limit seems more appropriate. The number of deaths in the second month after delivery has always been small.

In the three centuries between 1500 and 1799, there died within the first puerperal month approximately 16 times as many women as within each of the following eleven months. In women who married in the first half of the 19th century this proportion grew to

23 : 1, while in those whose reproductive activity started in the second half of that century the proportion became 77 : 1.

TABLE 1

DEATHS DURING AND FOLLOWING DELIVERY

Century of Marriage	Number of fertile * women	births	Number of maternal deaths: I week	Rest of I. month	Second month	Third month	All following 9 months	Within the I. year **	All deaths during the I. year
16th, 17th	808	4,619	51	34	6	6	34	9	140
18th	364	1,833	19	15	3	3	17	1	58
19th	367	1,610	18	9	—	2	7	—	36

* Excl. women of "lower birth" who married members of the ruling families.
** Without exact time relation to delivery.

The most crowded part of the first year is the day on which the pregnancy was terminated and the six following days. Of all deaths of the whole year, ⅓-½ occurred in the first week.

The number of deaths during the second and third month after delivery is still considerable, although not more than a small fraction of the losses sustained during the first puerperal month. The third to the twelfth month after delivery excel as the time of the lowest mortality within the whole reproductive age. Calculating the number of deaths per 100 fertile women and per month according to the time relationship with the last preceding delivery, one obtains for women married in the years 1500-1699, 1700-1799, and 1800-1899, respectively, the following values. Within the first month there occurred per 100 women 1.93, 1.87, and 1.51 deaths; within the second month after delivery 0.13, 0.17 and 0.11 deaths; in the last ten months of the first year, per month and 100 women 0.11, 0.11, and 0.045 deaths, respectively; finally per 100 women below the age of 50 years, per any other month separated by more than 12 months from the last preceding delivery there occurred 0.19, 0.14, and 0.08 deaths, respectively.

Deaths per 100 Deliveries.

Throughout the first 350 years under study the losses in life calculated per 100 deliveries were almost stable, not deviating consider-

ably from 2.0% (1.94,* 2.02 and 1.88% **). Of women who started their reproductive activity after 1849, 1.47 still died per 100 deliveries.

Compared with recent statistics these values are high indeed. In the U. S. A., the maternal mortality in 1920 was as high as 0.8%, and in 1940 only 0.36%. In former times, however, 2% were not unfavorable. According to Struyck (1753), in the years 1654-1742 in Broek, of almost 2000 mothers 2.5% succumbed in the first month, and 0.5% in the following two months after delivery. In obstetrical wards, maternal death toll reached the staggering height of 7-9%, but dropped in the second half of the 19th century, after Semmelweis' reforms had been accepted, to 0.7, 0.5 and even 0.3%. In England and Wales, according to the official statistics, the maternal mortality in 1850-1899 was not higher than 0.5%, and in the years 1906-1933 the specific portion of the maternal mortality was 0.4%. Compared with these values, the losses in ruling families among women who married after 1850 were rather high.

Deaths per 100 fertile women.

Of every 100 fertile women who married in the 16th or 17th century, 11.2 and 11.4%, respectively, died in puerperio. The death toll diminished to 10.1% in the 18th century, and was as high as 8.5 and 6.4% in women who started their reproductive performance in 1800-1849 and 1850-1899, respectively. At variance with the figures calculated per 100 deliveries, these figures demonstrate a continuous and considerable improvement, first appearing in the 18th century. This apparent discrepancy can be explained a) by the birth decline since the 18th century, b) by the ever diminishing danger which accompanied the first delivery.

In the five consecutive periods, on the average a fertile woman had 5.7, 5.8, 5.0, 4.5 and 4.4 deliveries, respectively. In the first 200 years under study, 100 fertile women were exposed to the danger of dying in puerperium 575 times, in the 18th century 500 times, and in the two most recent periods 450 and 440 times, respectively.

* Women married in 1500-1699. ** Women married in 1800-1849.

Therefore, in the 18th century the risk of dying calculated per 100 fertile women dropped, although the danger per 100 deliveries remained constant.

TABLE 2

ORDER OF BIRTHS IN RULING FAMILIES *

Births	Women married in 1500-1599	1600-1699	1700-1799	1800-1849	1850-1899
I	18	17	20	22	23
II–V	48	48	52	56	60
VI–X	27	27	22.5	20	16
XI + ...	7	8	5.5	2	1
	100	100	100	100	100

* excl. women of "lower birth" who married into the ruling families.

As a rule, the second and third deliveries are less dangerous to the mother's life than the preceding or all following deliveries. At the present time, in civilized countries where women with more than 4 or 5 deliveries are rare, the maternal mortality of all multiparae is a little exceeded by that of primiparae (see Yerushalmy, Palmer and Cramer (13)). Under more primitive conditions, however, the respective difference grows larger, although within the multiparae women with 5-20 deliveries are more frequent (see Peller (12), Table 43).

In accordance with present day experience the first delivery always proved more dangerous. This danger diminished more and more, while the losses per 100 deliveries other than the first, for 350 years did not show a similar tendency. Per 100 first deliveries, in the five consecutive periods under study there died within two months: 4.31, 3.45, 3.52, 2.78 and 1.60 women, respectively; the corresponding figures for all other deliveries were 1.50, 1.66, 1.64, 1.62 and 1.43%. The distance between mortality rates of primi- and multiparae diminished more and more.

Several factors were contributing to the decline of losses of life connected with the first delivery. First in rank are changes concerning the two extreme age groups, the very young and the rather old brides. There was an increase in fitness of young brides for repro-

duction, and secondly, older brides more and more abstained from any reproductive activity. The change in young women is indicated by the reduced interval between marriage and the time in which the first delivery terminated fatally. In the first 300 years, of the 450 fertile women married in the second decade of life, 15 died within two months after delivery; of them 5 were still less than 20 years old, 9 between 20 and 24 years, and 1 woman was older than that. In the 19th century's corresponding group, out of 130 women 2 died on account of the first delivery, both below the age of 20 years.

Age specific maternal mortality.

In the 16th century the age specific maternal death rates were about equally high for all fertile women under 40 years of age. In the 17th century deaths occurred much more frequently in women between 20-29 years than in other age groups. Since the 18th century the maternal death rates form a steep curve with its peak at 20-24 years.

TABLE 3

MATERNAL MORTALITY * PER 100 FERTILE WOMEN

Age and death	Married in 1500-1599	1600-1699	1700-1799	1800-1849	1850-1899
-19	2.17	0.70	1.23	2.90	—
20-24	2.70	3.43	5.54	3.40	2.61
25-29	2.97	3.92	2.56	2.47	1.75
30-34	2.70	2.19	1.32	1.25	1.72
35-39	2.88	2.60	1.75	1.33	1.18
40-44	1.58	1.96	—	—	—
45-49	0.60	—	0.39	—	—

* Death within two months post delivery.

In this table, as in the others, there are included only women with a "clear record" regarding age and reproductive activity. The values of Table 3 are not annual death rates, and must not be compared with usual statistical tables which give *annual* rates for *all* married women—including the childless.

Maternal and general mortality in the age of reproductivity.

Puerperal mortality accounts for a considerable portion of the mortality of fertile women. In the 16th and 17th century of 100 fertile women altogether 42.0 died before reaching the age of 50 years, 11.3 having succumbed to death within the first two months after delivery. The corresponding two values for the 18th century were 37.2% and 10.1%, respectively. Thus, in the first three centuries under consideration, in fertile women slightly more than 1 out of 4 deaths was due to puerperium. In the 19th century, mothers below the age of 50 had a total mortality of 23.1%, and a puerperal mortality of 7.4%. This gives a proportion of 1 out of 3 deaths. Exclusive of puerperal mortality, of fertile women who married 1500-1699—31.7% died in the reproductive age; in the 18th century the percentage diminished to 27.1%, while of those who married in the 19th century not more than 15.7% died below the age of 50 years.

Discussion.

The improvement shown in the case fatality rate of the first delivery, in contradiction to the stability in fatality rates of all following deliveries, indicates either a development in obstetrical skill or a better adaptation of the female body to the reproductive activity, or a combination of both. It was not until Semmelweis' discovery that the number of deaths per 100 deliveries other than the first dropped also.

The slow progress as indicated in the figures of the most recent group (married in 1850-1899) is rather astonishing. It seems to reflect the conservative spirit of those obstetricians who attended women of the high social classes.

The other important feature is the time in which the birth decline started. Usually, the later part of the second half of the 19th century is taken as the turning point, with France as an early forerunner (around 1820) (14). The present study shows that ruling families in the 18th century practised birth control to a degree which made it then statistically evident. In these times common people did not look at the offspring as a liability. Later on, on the verge of the 18th to the 19th century and in the first decades of the latter, an

attempt was made to impose upon the population a restriction of reproduction, already for generations a custom in high social strata. Several more decades passed before birth control became popular in the broader group of city dwellers, for whom in the meantime a great number of children lost the character of assets.

Summary.

1) Since the beginning of the 16th century, the number of puerperal deaths per 100 deliveries was stable, and did not diminish until the second part of the 19th century.

2) In the 16th and 17th centuries, of 100 fertile women 11.3% died due to pregnancy, delivery and puerperium. Maternal death rate per 100 fertile women has been diminishing since the 18th century, the chief reason being a considerable birth decline and a lower case fatality rate of the first delivery. In the 18th century, the number of deliveries was 12% lower, and in fertile women who married 1800-1849 the number was 22% lower than in the 16th and 17th centuries.

3) In the 16th to the 18th century maternal deaths accounted for 27% of all deaths of fertile women below 50 years of age. In the 19th century the corresponding value was 32%. The danger to the general health diminished more rapidly than the danger accompanying deliveries.

4) Throughout the four centuries under study, the safest period of life within the age of 15-50 years, was the time between the end of the second month up to the end of the first year after delivery.

C. Infancy and Childhood.

In most civilized countries, during the last decades infant mortality * as well as the death rates of the second to the fifteenth year decreased considerably, while in spite of concerted efforts the neonatal mortality ** and the stillbirth rates *** changed but little.

* Infant deaths below 1 year in percent of all born alive.

** Infant deaths in the first 7 days in percent of all born alive.

*** Number of all born dead except abortions and miscarriages, per 100 born either alive or dead.

The reason for the lack of any sizable improvement has been under intensive investigation for almost 20 years. Seibert (15), reviewing the literature, in 1940 concluded that "the actual causes of the neonatal mortality are largely unknown." A similar statement can be made with regard to stillbirths.

Studies on infant mortality go back as far as the second part of the 17th century. As long as a considerable percentage of infants died throughout the whole first year, the death rate of the first week had not attracted special attention. Thus Westergaard (2), who in his studies on ruling families had collected data for 2,901 infants born in 1700-1881, did not separate the neonatal period from the older infants.

Whereas previously the number of deaths in the 2nd to the 12th month of life was 2 or 3 or 4 times higher than the number of stillborn plus neonatal deaths, during the last 30 years the situation changed entirely. Now in various countries the number of stillborn plus infants who die during the first week exceeds by far the number of those who die during the rest of the first year. To indicate the changes which occurred since the 18th century, in Table 1 the rates of Vienna for 1752-1754 (4) may be compared with United States statistics for 1940.

TABLE 1

STILLBORN RATES AND INFANT MORTALITY (%) FOR VIENNA 1752-1754, AND UNITED STATES OF AMERICA IN 1940.

	(a) Still-born	(b) First Week	(c) 2nd-6th Week	(d) 2nd-6th Month	(e) 7th-12th Month	Total of the First Year	a+b	c+d+e
Vienna 1752-54...	2.2 *	7.5	8.7	17.2	7.1	40.6	9.7	33.1
USA 1940, whites	2.8	2.2	0.5	1.6		4.3	5.0	2.1

* See comment to Table 2.

In this paper there will be presented death and survival rates for 8,466 children of ruling families, born to parents who married between 1500 and 1930.

Stillborn.

During the years 1600-1849, the incidence of stillbirths was almost unchanged; 3.2, 3.0 and 2.9% for the respective periods (Table 2). Prior to this time and since 1850 stillbirths appear to be much less frequent.

TABLE 2

STILLBIRTHS IN RULING FAMILIES

Time of parents' marriage	(a) All born	(b) Stillborn	$\frac{a}{b} \cdot 100$	
1500-1599	1,903	21	1.1	
1600-1699	2,716	88	3.2	
1700-1799	1,862	55	3.6	
1800-1849	791	23	2.9	
1850-1899	820	9	1.1	0.84
1900-1930	374	1	0.3	

The low rate for the 16th century is spurious. Even nowadays differences in the incidence of stillbirths in various countries do not reflect correctly the actual conditions. In Catholic countries, some children who according to the records died "soon after birth" in reality have died during labor. For religious reasons they were baptized by the attending midwife. Since no stillborn baby can be baptized, they appear in the books as died post partum, thus diminishing the recorded rates of stillbirths and increasing recorded neonatal mortality. Furthermore there are countries where for no religious reasons but on account of social discrimination of women who had a stillbirth, the statistics are distorted in the same direction. On the other hand, in countries without registration of stillbirths some children who died soon after birth are dealt with as stillborn or miscarriage. This was done to avoid administrative procedure connected with the compulsory registration of both the birth and the death.

Custom and religion do influence the figures to such an extent that rates of neonatal mortality should always be checked against the rates of stillborn and vice versa. For scientific research both should be considered together, and no conclusion should be drawn unless both were recorded.

The figures of the next table justify the statement made above with regard to the low stillbirth rate in the 16th century, while the low rates since 1850 have to be taken as real.

Neonatal Mortality in the Ruling Families.

In the 16th and 17th centuries, a considerable number, 7.7% and 3.9%, respectively, of those who died in infancy have been recorded without sufficient data for exact classification according to age. Most of them died "young," which indicates that they were either stillborn or died soon after birth. In this paper they will be considered as having died during the first week. Many children died in the calendar-year of birth, without further details. These cases will be added to those who died in the second through twelfth month of life. In some cases it is even doubtful whether the child died in the first or second year. In studying the figures for the 16th and 17th centuries the above-mentioned defects will have to be borne in mind. For the 18th century full data are available in almost all cases, and the uncertainties of the first 200 years disappear. With respect to the 18th century there is only the question whether the neonatal mortality was 4.5% or 4.7%. Such a degree of doubt is applicable even to the most recent statistics of the United States, and may therefore be disregarded. In the following 50 years (1800-1849) the neonatal mortality diminished to 3.4%, and since then has decreased to 1.01%. The latter figure is not substantially higher than the stillbirth-rate for the same period of observation (0.84%).

TABLE 3

NEONATAL MORTALITY IN RULING FAMILIES

Time of Parents' Marriage	Born Alive %	Of those born alive there died			
		I day %	II-IV day %	"Young" %	I Week %
1500-1599.....	1,882	(2.7)	(1.0)	5.2	8.9
1600-1699.....	2,628	(3.3)	(1.75)	2.4	7.5
1700-1799.....	1,807	2.9	1.6	0.2	4.7
1800-1849.....	768	2.3	1.1	—	3.4
1850-1899.....	811	0.6	0.6	—	1.2
1900-1930.....	373	0.3	0.3	—	0.5

In the 16th and 17th centuries stillborn plus neonatal deaths taken together amounted to 10.0 and 10.75%, respectively. In these figures have been included those who died "young." In recent times such high losses are found only in illegitimate children. In the 18th century the death rates accounting for stillborn and neonatal losses diminished to 7.7%, and in the following 50 years to 6.3%. Parents who married during the years 1850-1930 have lost not more than 1.85% of their children in stillborn plus neonatal mortality.

Even up to the present time (1940) no country as a whole has succeeded in lowering the corresponding value to 1.85%, the usual figure being approximately 5 to 6%.

It is well established that in premature children the frequency of stillborn plus neonatal deaths is about 15-25 times higher than in full term births, in illegitimate twice that of legitimate children, in the lowest social class 1.5 times that of the first social class, in children of older mothers higher than in the offspring of young women, in boys higher than in girls, in Negroes 1.5 higher than in whites, and in multiple and complicated deliveries much higher than in single and spontaneous births. Statistics in hospitals in Philadelphia (R. M. Tyson) (16), Chicago (Hillis and Bennensohn (17), Potter and Adair (18)) and New York (Ronsheim (19), M. Gleich (20)) have shown that in most recent years the stillborn rate (without abortions) was 2.3 to 3.0%, and the neonatal mortality 2.1 to 3.2%, both together amounting to 4.4-6.2%. These figures are 2.5 to 3.5 times as high as encountered in the ruling families for the period 1850-1930.

In view of what was said above about the effect of various biological and sociological factors and especially of prematurity on the recorded level of stillborn rates and neonatal mortality, the statistics presented here suggest that in ruling families in the early centuries the frequency of premature children was several times higher than in the 19th century. After 1850 the incidence dropped further, being since then considerably lower than it is in most recent times in the average of legitimate children of the general population. That difference is so huge that one is inclined to doubt the validity of the figure computed for 1850-1930. However, as will be shown in the discussion, there is every reason to accept them as fact.

Mortality During the Rest of the First Year.

In the ruling families, in the 16th century, 19.3% of the infants born alive died during the first year. This figure includes those who died in the first week. In the 17th century the infant mortality was higher than at any other time; it rose to 24.6%. Perhaps this is symptomatic of the general decline in personal as in public hygiene, characteristic for the 17th century. In dealing with the mortality of women we were unable to trace the effects of the declining standards of hygiene and cleanliness to the ruling families. With regard to childhood however the situation is different. In the 17th century the mortality increased considerably, not only in infancy, but also—as will be seen later—in the age groups 1-4 and 10-14 years. Since then the mortality has been diminishing consistently; 15.3% * in the 18th century, 9.6% and 4.1%, respectively, in the two halves of the 19th century, and 0.8% in the most recent period (1900-1930).

TABLE 4

INFANT MORTALITY IN RULING FAMILIES.

Time of parents' marriage	Of 100 born alive there died during: 8th day to end of 1st month	Whole first month	Second to twelfth month	Second week to twelfth month	The first year
1500-1599	0.9	9.8	9.5 *	10.4 *	19.3
1600-1699	2.1	9.6	15.0 **	17.1 **	24.6
1700-1799	1.5	6.0	9.3	14.6	15.3
1800-1849	1.6	5.0	4.6	6.2	9.6
1850-1899	0.5	1.7	2.3	2.8	4.1
1900-1930	0.0	0.5	0.3	0.3	0.8

* Includes 2.7% of infants who died within the first year without the exact age recorded.

** Includes 1.5% of infants who died within the first year without the exact age recorded.

The mortality of the second through the twelfth month decreased earlier than that of the first month. Sine 1850, however, there was a rapid decrease in both early infancy as well as in the rest of the first year.

* This figure is identical with that of Westergaard.

Considering the high infant mortality of the past one usually thinks of gastrointestinal disturbances. However, in the early centuries high mortality of the second to twelfth month does not necessarily point in this direction. Then diseases of the cold season and infectious diseases were of utmost importance. Significantly, in the 17th as well as in the 18th century the months July and August had a smaller death toll than February and March. In the 17th century the two summer months have less deaths than one would expect on the basis of ⅙ of the year. In the 18th century, July and August were only 13% above the average, while February and March exceeded the average number of deaths (II-XII months) by 30%. While the general population in the 17th and 18th centuries had a summer peak in the infant mortality * (Graetzer (23), Gottstein (24), Peller (25)), the royal families were free of it.

Comparing the material under consideration with statistics of whole countries or nations, the infant mortality of the ruling families in the 18th century equals that of the general population of Sweden in the 1840's, of England in the 1860's, of Finland in the early 1880's, of Switzerland in the early 1890's, of Holland around 1900, of Italy and Germany in 1910-1915. Thus, in the 18th century the infant mortality of the ruling families was about 90-160 years ahead of the general population, In the 19th century the advantage of the ruling families was less. The level of 9.6% as exhibited by this group of families in 1800-1849, is equal to that of New Zealand in the 1870's, of Norway and Sweden in the 90's, of England, Holland and Switzerland from 1910-1915, of whites in the United States Registration Area in 1916, of France, Finland, Belgium and Germany in the 1920's, of the Negroes in the United States of America in 1930, and of Italy in 1939.

In the second half of the 19th century, when the infant mortality of various countries ranged between 8.5% and 21.4%, with some areas in Central Europe having a mortality not less than 48.4%, the ruling families succeeded in lowering their infant mortality rate to 4.1%. At the present time this value has been reached and even

* It may be pointed out that the physicians and statisticians of these centuries, although they were interested in the reasons of the high death rates, were unaware of the summer peak.

lowered by New Zealand (1921-1925) and Sweden and the Netherlands (in 1935-1938). In the United States as a whole, the infant mortality of whites in 1940 was 4.3% and that of Negroes 7.3%.

TABLE 5

INFANT MORTALITY

	Number of deaths per 100 born alive			
	First week	First month	2nd-12th month	2nd week through 12th month
Ruling families, 1850-1899..	1.2	1.7	2.3	2.8
United States, whites, 1940..	2.2	2.7	1.6	2.1
Negroes, 1940.....	3.0	3.9	3.4	4.3
New Zealand, 1940.....	1.85	2.2	0.8	1.15

Death Rates of the Ages 1 to 15 Years.

In the 16th and 17th centuries, in ruling families the death toll of infancy (988 deaths) exceeded by almost 80% that of children of 1 to 14 years of age (552 deaths). In the 18th century, while the infant mortality was already declining, the mortality of the second to tenth year of age increased further and reached an all time peak. Couples who married 1700-1799 lost 291 of their children in infancy and 304 at the age of 1-14 years. Apparently even this group of highly privileged families was unable to escape the growing menace of infectious diseases including smallpox which was then a children's disease par excellence. In the first half of the 19th century, both the infant mortality and the mortality of the preschool age children improved rapidly, whereas the death rate of older children gave little ground.

In the 18th century, in the high aristocracy 13.3% of children who entered the second year of life died before reaching the sixth year; for 1800-1849 the corresponding figure was only 6.8%. This was still in the pre-bacteriologic era. The history of medicine demonstrates that long before Pasteur and Koch, physicians and laymen had gained a good deal of insight into the pathogenesis and prevention of various infectious diseases. Gatti, Plenciz, Lind, Howard, Jenner and Frank of the 18th century, and Snow, Budd, Davaine and Ville-

min in the 19th century are a few representative names. With few exceptions, amongst the general population, the fruits of the application of growing epidemiological experience and understanding did not become visible before the 1870's; in children it became manifest later than in adolescents, in children of pre-school age later than in children of school age.

TABLE 6

MORTALITY OF CHILDHOOD IN RULING FAMILIES AS COMPARED WITH THAT OF UNITED STATES AND ENGLAND

Time of parents' marriage	Infant mortality %	Survivors of i. year	Died in ii-v year %	Survivors of v. year	Died in vi-x year %	Survivors of x. year	Died in xi-xv year %
			a) ruling families				
1500-1599	19.3	1,518	7.7	1,402	3.7	1,350	2.0
1600-1699	24.6	1,981	12.3	1,737	3.8	1,671	3.0
1700-1799	15.3	1,528	13.3	1,325	6.1	1,244	1.6
1800-1849	9.6	694	6.8	647	4.8	617	2.1
1850-1899	4.1	778	3.7	749	0.5	745	0.9
1900–	0.8	351 *	1.1	299 **	1.3	219 ***	0.5
			b) United States				
Whites, 1930-39 ø	5.1		1.6		0.75		0.6
Negroes, 1930-39 ø	6.9		2.5		0.97		1.1
			c) England and Wales				
1938 ø	5.3		2.25		0.92		0.6

* Born 1900-1930.
** Born 1900-1926.
*** Born 1900-1921.
ø The year for which the mortality was computed.

The official mortality statistics reflect not only the spread of understanding for the necessities in the combat of infectious diseases in a world with growing city agglomerations, but also improvement in the care for the sick, and a gradient in evaluation of life according to the age of the individual and in intensity of the applied measures.

Comparing, for instance, the calculated rates one learns that the mortality level of the 1-4 year old child of the ruling families of the period 1800-1849 was reached by the English population about 1881-1890, while the rates of the 5-14 year old child were already reached in 1840-1870.

It is not less instructive to confront the most recent data of the ruling families with the statistics of United States white population for 1930-1939. The latter is lagging behind as far as infant mortality is concerned, less with regard to the 1-4 year age group (in which during the last 40 years tremendous progress has been achieved), and not at all in the age groups 5-14 years. Neither do other progressive countries lag behind when their school age children are compared with the most recent data of the ruling family group.

Furthermore, the analysis reveals that in all centuries under study just as at the present time the age group of 10-14 years had a mortality lower than that of any other age group.

Survival Rates.

The 17th century with its 30 Years War, pestilences and famine had the lowest survival rates of all the time since the Renaissance. Only 61.7% of the children born alive reached the end of the 15th year, while the corresponding figure for the 16th century was 70.1, and for the 18th century 67.7%. Since then there has been a continuous and accelerated improvement in the survival rates. As many as 96.4 out of 100 children born alive in 1900-1921 to mothers of ruling families who married since 1900 lived through the 15th year. This figure exceeds by 4.3 and 8.2 points the respective percentage of whites and Negroes in the United States for 1930-1939, while the survival rate for 1850-1899 (91.0%) was 18 points ahead as compared with the English population born in 1876.

This illustrates the magnitude and rapidity of the progress made by the general population in recent decades. The advantage of the ruling families in surviving childhood becomes more and more restricted to the gains achieved at the time of birth and in the first week afterwards.

TABLE 7

SURVIVALS IN RULING FAMILIES AS COMPARED WITH THE GENERAL POPULATION OF THE UNITED STATES 1930-1939

Time of parents' marriage	Of 100 born alive there survived the first	fifth	tenth	fifteenth year of life.
a) Ruling families				
1500-1599	80.7	74.5	71.1	70.1
1600-1699	75.4	66.1	63.6	61.7
1700-1799	84.7	73.3	68.8	67.7
1800-1849	90.4	84.3	80.4	78.7
1850-1899	96.0	92.3	91.8	91.0
1900-1930	99.2	98.1	96.7	96.4
b) United States, 1930-1939				
Whites	94.6	93.9	92.6	92.1
Negroes	92.4	90.0	89.1	88.2

Discussion.

During the last 7 to 8 decades, in several countries health conditions improved to such an extent that at the beginning of the second world war for the school age group the general population was not behind the goal reached by the children of the most privileged European families in 1900-1936. There is almost the same favorable comparison in the mortality of infants who survived the first week of life. However, for the second to fifth year the differences are still markedly in favor of the ruling families, and still more so with respect to the incidence of stillbirths and to the mortality of the first week.

The combat of the death toll of the second to fifth year is now less a matter of further research than of the application of its results and of the improvement of the general conditions of life as well as of the care for the child. This we learn from the statistics. In the United States, in 1940 of all children who died at 1-4 years of age, 17.3% were victims of fatal accidents and 39.9% died of pneumonia and infectious diseases. These percentages are highly reducible.

With regard to stillbirths as well as the neonatal mortality the problem seems different. Though during the last decade some progress has been achieved, medical science is still at a loss in the understanding of the cause of prematurity which is the predominant factor among the causes of death. Therefore, the historical analysis given in this paper may be of help.

There is a widespread assumption that the failure to achieve much more than has been accomplished is mainly due to inherited, constitutional or familial factors involved. The rapid and radical reduction of the stillbirth rates and of the neonatal mortality in ruling families since 1850, rules out that hypothesis. Hereditary factors can play only a minor rôle. Hence, no pessimistic view is justified.

In Central Europe, after the first world war prematurity was more frequent than in the years preceding the war. Consequently the incidence of stillbirths and neonatal deaths rose (25). In well-to-do families the incidence of premature children is smaller than in economically lower strata; in married women smaller than in unmarried mothers, in private hospitals smaller than in public institutions. However, by materially improving the conditions for the prospective mother, for instance by placing the pregnant women in a rest and recreation home for 4-8 weeks preceding delivery, the incidence of premature children can be reduced to a great extent, and thus also the stillbirths and neonatal deaths.

TABLE 8

PERCENTAGE OF STILLBORN PLUS NEONATAL DEATHS IN THE THIRD OBSTETRIC WARD AT VIENNA'S GENERAL HOSPITAL, 1927-1929.

Time in hospital spent by mothers prior to delivery	Stillborn plus neonatal deaths in		
	legitimate	illegitimate	all
	In % of all of each subgroup		
1/ 0-7 days.....	8.8	10.2	9.6
2/ 8-28 "	3.0	4.3	3.8
3/ 29-56 "	1.6 (!)	3.2	2.8

Two facts have to be faced: a) in spite of the privileged position, the losses in ruling families prior to 1850 were higher than they are today in the general population, and b) extraordinary favorable

stillbirth rates and neonatal mortality are not restricted to castles of the high aristocracy. It is unknown what caused the changes in the latter group. With a high probability it can be said that they are not accounted for by progress in medicine during the second part of the 19th century. Otherwise, one could not understand the much higher losses reported from hospitals in the papers mentioned in this study.

Most probably in the 19th century the ritual character of court habits with its great strain on health of the young female was first modified by the adjustment to the physiological needs of rest and relaxation in pregnant women. Apparently incidence of prematurity is not a matter of wealth or privilege, but of the degree of relaxation and physical and mental rest. Even for poor women possibilities for adequate relaxation can be secured and similar results can be obtained as in the most privileged women. Twenty to sixty years ago the fetus was assumed in its growth to be entirely independent of the conditions of the mother. There is no doubt that this is not so. Under conditions favorable for the mother the fetus develops better and becomes more fit for the strain of delivery.

The inference from the historical analysis therefore is, that the combat of the intra and post partum mortality is less a matter of successful treatment of premature children than of possible prevention of prematurity.

Conclusions.

1. A total of 8,466 births in ruling families for the period 1500-1930 has been analyzed.
2. The incidence of stillborn diminished from 3.2% to 0.3%, the infant mortality dropped from 24.6% to 0.8%, the mortality of the first week fell from 7.5 to 0.5%, the mortality of the following 51 weeks of the first year decreased from 17.1% to 0.3%.
3. The historical analysis indicates the possibility of reduction of the stillborn rate and of the neonatal mortality in the general population far below the present level. Furthermore it indicates the direction in which the remedy has to be sought.

4. The mortality intra and post partum is determined mainly by physiological conditions influencing the intrauterine development of the fetus and the termination of the gestation period. The restoration of suitable physiological conditions is the main issue. Where pathology is involved, it has to be supported by adequate therapeutic efforts.

5. In passing the age of 1-4 years, in 17th and 18th centuries, 12.3% to 13.3% of the children of ruling families died, while in the most recent period only 1.1% were lost, which is considerably below the losses in the general population.

6. In school age children the survival rates of the ruling families improved less than those of the younger age groups. In 1930-1939, the children of the white population in the United States were not at a disadvantage as compared with the most recent data of ruling families.

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THE DEVELOPMENT OF A STATE HEALTH SERVICE IN MICHIGAN

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> The efficiency of a board of health and the respect which will be shown it in a community will depend very much upon the firmness with which the members insist upon a strict compliance with all needful sanitary regulations, as well as the caution they display in avoiding needless exactions and unnecessary investigations.
>
> —Hon. LeRoy Parker, 1879.[1]

According to Dr. George E. Ranney, a law providing for local boards of health had been on the statute books since the state was first organized.[2] In 1871, however, another law, more specific in nature, was passed which gave the local board of health broad powers; but for some reason, it failed to define them. According to available records, this law was apparently given little attention by those who were expected to enforce it.[3] "When the State Board of Health was established," said Dr. Henry B. Baker, "there was scarcely a working local board of health in the State."[4]

Soon after the Board was organized, however, steps were taken to stimulate local boards of health to activity. Circular No. 1 was issued for the avowed purpose of obtaining information as to the extent of their activities, and for the general purpose of placing the State Board of Health in communication with the local boards of health already in existence.[5] This document was sent to the clerks of all local boards of health throughout the state.

The response to the circular was neither overwhelming nor disappointing. Of the 1,147 local boards of health in the state, three hundred forty-five clerks complied with the law requiring them to

[1] *An. Rep.* S. B. H., VII, 360.
[2] *Ibid.*, IX, 172.
[3] *Ibid.*, II, xxviii; *ibid.*, II, xxv; *ibid.*, p. xxix; MacClure, *op. cit.*, p. 10.
[4] *Ibid.*, IX, 172; according to MacClure, "Local boards of health created by the law of 1871 had no health officers. The law being of a permissive nature, the boards of health failed to appoint any." (MacClure, *op. cit.*, p. 11.)
[5] *An. Rep.* S. B. H., II, xxviii.

send a report to the State Board of Health.[6] As Dr. Baker expressed it, "The fact that three hundred forty-five clerks sent in reports is some evidence that there was no real impossibility in the matter and that others might have done so if they chose."[7] From the data so obtained from clerks of local boards it was revealed that many of the local boards of health had never convened as such. The law, so it has been pointed out, failed to require them to meet at any stated time.[8] Of the thirty-eight cities in the state, only eleven had a clerk.[9] "There seems to be a greater degree of indifference to all laws and measures for promoting the public health in villages," said Dr. Baker, "than in either cities or townships, and this is particularly unfortunate, because it is in just such places that so much can be done in the way of preventing sickness and death."[10]

In 1879, Dr. DePuy, Health Officer of Grand Rapids, wrote Dr. H. B. Baker as follows concerning his activities in that city: "The health officer has never had the least duty prescribed for him, or function to perform except the care of the sick, and he is literally devoid of power to abate or cause to be removed the most flagrant nuisance."[11] At the time this letter was written, a misunderstanding had arisen relative to the duties and compensation of the health officer and the city physician, a two-fold responsibility which happened to be vested in the person of Dr. DePuy; in addition, it happened that the members of the board had expressed an unwillingness to make the necessary returns to Lansing that were expected of them by the State Board of Health.[12] Their city attorney, so it is stated, had ruled that local boards of health were not bound by law or the city charter to make such returns to the State Board of Health. Concerning these questions, the Hon. LeRoy Parker of the State Board of Health declared:

> 1. The office of health officer and city physician are distinct and separate offices. . . . The council alone can fix the compensation for either office. The council can prescribe the duties of either officer, but the health officer, in addition to the duties prescribed by the council, must perform such duties as are required by the general law.

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[6] *Ibid.*, p. xxv.
[7] *Loc. cit.*
[8] *Ibid.*, p. xxix.
[9] *Ibid.*, p. xxviii.
[10] *Loc. cit.*
[11] *Ibid.*, VII, 141.
[12] *Ibid.*, p. 142.

2. Unquestionably the health officer is entitled to pay for his services, but if the council see fit to make his salary as city physician cover his official duties as health officer, it is a matter wholly within the control of the council.

3. The legislature by Act. No. 56, laws of 1877, provided for the payment of all duties or services performed by health officers to be fixed by the boards of health; but the amendment of section 1740, compiled laws of 1871, made in 1879, expressly excepts from the operation of the general law, cities and villages whose charters containing provisions inconsistent therewith. If the charter of the city of Grand Rapids made no provisions for the appointment of a health officer or for his compensation, it would clearly be the duty of the board of health to appoint such officers and fix his compensation.[13]

As originally constituted, the law on the statute books in 1871 *permitted* the local board of health to appoint a health officer.[14] In addition, as previously pointed out, the law failed to specify when the board was to meet.[15] These circumstances of themselves permitted laxity and inadequate reporting once the State Board of Health was established and began to require regular reports. As the result of efforts by members of the Board, however, this situation was shortly to be changed. In his annual address on April 11, 1876, Dr. Hitchcock raised the following questions: "At least," he asked, "is it not possible for us to secure the enactment of a law that shall require that in every city, village, and township a well-educated, efficient physician be made, either by election or appointment, the health officer of the city, village or township, and as such, the executive officer of the local board of health? The law providing for such an officer should point out, at least in outline his duties, . . . , and should name suitable penalties for the non-fulfillment of those duties. Would it not be well, that, among other duties, he should receive the statistics of births and deaths, and, perhaps, marriages, and that once in three months he should make his report of these statistics to the county clerk, or directly to the State Board of Health?"[16] As the result of his efforts and those of other members of the State Board of Health, a change was made in a law passed in 1877 known as Act No. 56, compiled laws of 1877. Sections 1692 and 1693, compiled laws of 1871, were amended by Act No. 56, to read as follows:

[13] *Ibid.*, p. 145.
[14] MacClure, *op. cit.*, p. 10; *An. Rep.* S. B. H., II, xxviii.
[15] *An. Rep.* S. B. H., IX, 172. [16] *Ibid.*, IV, 11.

The people of the State of Michigan enact, That sections 1692 and 1693, chapter 46, of the compiled laws of 1871, be and the same are hereby so amended as to read as follows:

(1692) Section 1. In every township the township board shall be the board of health. The supervisor shall be the president, and the township clerk shall be the clerk of said board. The clerk shall keep a record of the proceedings of the board in a book to be provided for that purpose at the expense of the township.

(1693) Section 2. Every township board of health shall appoint and constantly have a health officer of the township who shall where practicable, be a physician and sanitary advisor, and an executive officer of the board; Provided, That in townships where it is not practicable to secure the services of a well-educated and suitable physician, the board may appoint the supervisor or some other person as such health officer. The board of health shall establish his salary or other compensation, and shall regulate and audit all fees and charges of persons employed by them in the execution of the health laws and of their own regulations. Within thirty days after the annual township meeting in each year, the board of health shall meet for the transaction of business and shall appoint or re-appoint a health officer, and shall immediately cause to be transmitted to the Secretary of the State Board of Health, at Lansing, the full name and post office address of such health officer, and a statement whether he is a physician, the supervisor, or some other person not a physician. A special meeting of the Board may be called by the order of the president or of any two members of the Board.

Section 3. This act shall take immediate effect.

Approved April 20, 1877.[17]

Section 49 of chapter 46 of the compiled laws of 1871 made the laws laid down in Act No. 56 apply to cities and villages; that is, it required "that a health officer shall be appointed in each city and village, preferably a physician."[18]

Shortly after Act No. 56 was passed, a circular, No. 18, was sent to all supervisors of local boards of health in the state.[19] This called their attention to the change in the aforementioned law. In addition, it asked for the name and address of the township health officer. The events which followed were in striking contrast to the poor cooperation local boards of health had previously shown.[20] The passage of Act No. 56, it is said, marked the beginning of better local health organi-

[17] *Ibid.*, V, xx.
[18] *Ibid.*, p. xxi.
[19] *Ibid.*, p. xix.
[20] MacClure, *op. cit.*, p. 10.

zation in the state.[21] Another circular, No. 20, was sent at the same time as circular 18 to all cities and villages in the state, setting forth the implications of Act No. 56, and the opinion of the Attorney-General on the appointment of health officers by cities and villages. In addition, a blank was enclosed for the return of the names and post-office address of the local health officers.[22] These measures had a decided effect over the entire state.[23]

Employment of Health Officers

From the returns of circular No. 1, it was learned that one-fourth of the local boards of health had health officers in 1873.[24] These numbered one hundred and sixteen in forty-two different counties.[25] Following the receipt of circular No. 18 in 1877, it was learned that eight hundred and fifty townships appointed health officers.[26] By 1886, the list of health officers returned to the secretary of the State Board of Health revealed that all but two hundred and thirty-eight localities in the state were provided with such officials as the law required.[27]

The publication of this list each year by the State Board of Health proved useful in several ways. It enabled the local boards of health to inform more easily other neighboring boards of health of the presence of dangerous communicable diseases, and secured to the office of the secretary of the State Board of Health more prompt and complete returns.[28]

Health officers active at the time the State Board of Health was established were mainly laymen. Not until Act No. 56, laws of 1877, was passed did it become possible for the State Board of Health to take steps to encourage the employment of medically trained health officers in accordance with the law.[29] "The main reason why we

[21] *An. Rep.* S. B. H., V, xx.
[22] *Ibid.*, p. xxi.
[23] *Loc. cit., ibid.*, IX, 172.
[24] *Ibid.*, I, 29.
[25] *Ibid.*, I, 30.
[26] *Ibid.*, V, xx.
[27] *Ibid.*, XIV, lx.
[28] *Ibid.*, XIII, x.
[29] *Ibid.*, VI, xlv; according to MacClure, "opinion was divided as to who should appoint the local health officer. Some believed that the State Board of Health should do this. Others including the Hon. Witter J. Baxter, believing in the principle of local self-government, believed that the local board of health should do this. The latter opinion prevailed." (MacClure, *op. cit.*, p. 11.)

need an active health officer who understands his business, in every city, village and township, is that the people do not now seem to know the preventable nature of the diseases which kill them," said Dr. Baker.[80] "We might better put a blacksmith in charge of a milliner's shop," he said, "than to choose as our health officer one who does not understand the nature of those vital actions which human bodies undergo in health, and of those processes which are coincident with disease." [81] In a paper read before the twenty-first annual meeting of the State Medical Society in 1886, Dr. O. W. Wight, Health Officer of Detroit, advocated examinations to determine the fitness of prospective county health officers. He proposed an examination to cover medical knowledge, sanitary engineering, chemistry, laws of nuisance, public health laws. In addition he said, referring to the prospective health officer, "His executive capacity and his character for industry, impartial justice, discretion, and moral courage, should be taken into consideration." [82]

Some cities in the state were negligent in the matter of conforming to the public health laws.[83] Others willfully disobeyed the law requiring that the health officer "shall be a physician." [84] "In Detroit, in Bay City, in Grand Haven, and perhaps in other cities in Michigan," Dr. Baker declared in 1880, "it seems to be considered too expensive to have a health officer and pay him, as should be done, two thousand dollars a year, and require his entire energies to be put forth for the prevention of sickness and deaths." [85] Bitterly criticizing the laxity of Detroit city officials, Dr. Baker on one occasion asserted that "in Detroit there are two hundred and forty deaths from preventable causes repeated every year, and that city so healthy that its only need of a health officer is 'to report our vital statistics to Lansing' and the council is asked to hire a cheap man to do that." [86]

In 1881, another law was passed relative to local boards of health: "Within thirty days after the annual township meeting in each year,

[80] *An. Rep.* S. B. H., VIII, 127.
[81] *Ibid.*, p. 122.
[82] *Trans.* M. S. M. S., VI (1886), 267.
[83] *Proc. and Addresses* Mich. San. Conventions, 1880-4, 129.
[84] *An. Rep.* S. B. H., VIII, 122; *ibid.*, XI, 67.
[85] *Proc. and Addresses*, Mich. San. Con., *op. cit.*, p. 129.
[86] *An. Rep.* S. B. H., VIII, 124.

the board of health shall meet for the transaction of business, and shall appoint or re-appoint a health officer. After such appointment the name and address of the health officer must be sent to the secretary of the State Board of Health." (Sec. 1693 of the Compiled Laws of 1871 as amended by Act No. 202, Laws of 1881.) [37]

Pursuant to activities of the State Board of Health and sanitarians elsewhere in the state, a law was passed in 1881 which provided for the establishment of a board of health for the city of Detroit. In the clauses of this act are the requirements that the health officer must "have a knowledge of chemistry, hygiene, and sanitary matters." [38]

Oath of Office

In response to a letter of Dr. Henry B. Baker in 1877, calling attention to the numerous inquiries from health officers relative to an oath of office, Attorney-General Otto Kirchner in 1877 ruled that in his opinion the act of April 20, 1877 (Act No. 56, Laws of 1877) implied that the health officer should take and subscribe to the constitutional oath of office, and that the same should be filed in the office of the township clerk.[39] In 1883, Secretary Baker called attention to changes in the public health laws of the state in a circular (64), citing among others the following pertaining to the oath of office: "Before entering upon his duties the health officer must take and subscribe the official oath required by Sec. 1, Art. xviii, of the Constitution of this State, and file the same in the office of the clerk of the city, village or township of which he is the health officer." [40]

Compensation of Health Officers

"Except for a very few of the larger cities," writes MacClure, "it has been unusual for the health officer to receive more than one hundred dollars for his year's work; and in many instances, the

[37] *Ibid.*, XI, 68; on July 14, 1885 the State Board of Health voted that the names and addresses of the health officers of Michigan be printed and distributed. (*Ibid.*, XIII, xxxiv.)

[38] *Ibid.*, IX, 61.

[39] *Ibid.*, V, xxxvi.

[40] *Ibid.*, XI, 68.

amount is much less." [41] This condition caused the State Board of Health to endeavor to procure legislation for improving the status of the health officers of the state. In 1879, at the regular meeting of the Board, the Hon. LeRoy Parker, reported that he had prepared an opinion relative to the duties and compensation of the health officer for Grand Rapids in response to a request from the board of health of that city.[42] In 1882, he again submitted an opinion which was

[41] MacClure, *op. cit.*, p. 14; in the proceedings of the Detroit Common Council on Nov. 15, 1859 there appeared the following: "Alderman Miller, 7th offered the following minority report:

To the Honorable, The Common Council:

The undersigned, the minority of the special committee to whom was referred the resolution of Alderman Williams, of the first, which reads as follows:

Resolved, That the physicians of the city of Detroit be allowed $100 each for the current year as a compensation for medicine, in addition to their present salary; respectfully report that on Tuesday, Dec. 21, 1858, a resolution was adopted by this council, instructing the Committee of Ways and Means to report salaries of appointed city officers; and on Tuesday, Jan. 4, 1859, the said Committee, among other things, reported that $200 should be paid each of the city physicians as their salary for the year 1859, which report was adopted; and on Tuesday, Jan. 11, 1859 the present city physicians were appointed by your honorable body. Your committee would therefore report against the adoption of said resolution for the following reasons:

1st, That the city physicians knew what their salary would be if appointed.

2nd, That there has not been any epidemic in this city from the time of their appointment to the present day.

3rd, That there are other republican physicians of equal talent that are willing to take the office of city physician and ask no increase of salary.

The resolution lost. (Let. Free Press, Nov. 18, 1859, p. 4.)

Six years later the following item appeared in the Detroit Tribune:

On motion of Alderman Bond the report of the Committee on Ways and Means, relative to raising the salaries of city officers was taken from the table. After considerable squabbling the report was amended and adopted as follows:

	Per Annum	An Increase
Mayor	$1,200	$1,200
City Clerk	1,200	1,500
City Attorney	1,500	1,600
City Physician, 1st district	350	400
D. O. vaccinating	50	50
City Physician, 2nd district	350	400
D. O. vaccinating	50	50

* * * * * * * * *

(Det. Trib., Jan. 4, 1865, p. 1)

[42] *An. Rep.* S. B. H., VIII, xxxviii.

ordered printed and distributed about the state.[43] In his annual address for that year, Mr. Parker urged that local health officers be better compensated for their work.[44] Fortunately the Board was able to establish a precedent in 1881 in the act creating the Detroit Board of Health (Act No. 399, Local Acts of 1881). This act set the health officer's salary of that city at three thousand dollars per annum.[45] In 1883, the State Board of Health succeeded in getting compensation for health officers throughout the state. Section 3 of Act No. 137, Laws of 1883, provided as follows:

> Sec. 3. In the fulfillment of the requirements of this act, the health officer, unless other provisions shall have been made in accordance with the law, shall be entitled to receive from the township, city or village of which he is health officer, compensation at the rate of not less than two (2) dollars per day; Provided, That this section shall not be construed to conflict with any section by the local board of health, under section sixteen hundred and ninety-three, of the compiled laws of eighteen hundred and seventy-one, as amended by act number two hundred and two, of the laws of 1881.[46]

In 1887, the question again came up for discussion by members of the State Board of Health. Drs. Arthur Hazlewood and Henry B. Baker were appointed a committee to devise certain questions relative to health officers' salaries in a circular to be sent local health officers.[47]

Dr. O. W. Wight, health officer of Detroit, declared on one occasion before the State Medical Society that a tax should be imposed on the people for the purpose of maintaining county sanitary organizations throughout the state. He proposed a tax equivalent to ten cents per capita to be levied by the state to secure the services of a health officer, clerk, and sanitary inspector for each county.[48]

Duties of Health Officers and Clerks of Local Boards of Health

At the time the State Board of Health was established, the principal duty of the local health officers consisted in the abatement of nuisances.[49] Oftentimes, following their appointment, many of them

[43] *Ibid.*, X, xxxii.
[44] *Ibid.*, p. 359.
[45] *Ibid.*, IX, 61.
[46] *Ibid.*, XI, 72.
[47] *Ibid.*, XV, xlvi.
[48] *Trans.* M. S. M. S., VI (1886), 266.
[49] MacClure, *op. cit.*, p. 11.

were in doubt as to the nature and extent of their duties, and as a result many inquiries came to the office of the State Board of Health.[50] In order to remedy this situation, circulars were sent out regularly to local boards of health by Secretary Baker giving the opinion of the Board and setting forth the laws governing their duties.[51] In September, 1877, the first circular (19) of this kind was sent to all township health officers in the state. Included with this circular was a blank form for a record of cases of communicable diseases.[52] A similar circular (21) was also sent to health officers of all cities and villages in the state.[53] Because of the many new appointments of health officers each year, circulars of this kind had to be distributed annually. In the course of time many revisions were made, and accordingly circulars were reprinted to conform to these changes.[54]

"Freedom from nuisances was considered to be one essential condition of good health in a community," said Dr. Baker, "and the board of health and health officer who did not remove and prevent such unsanitary conditions was considered to be guilty of a plain neglect of duty and a violation of official trust." [55] As executive officer and sanitary adviser of the local board of health, the health officer was expected to give notice to the prosecuting attorney of the county of any failure of householders or physicians to report cases of communicable diseases to the local board (Act No. 157, Laws of 1879).[56] Act No. 146, Laws of 1879, made it the duty of the health officer of each city, village, or township to offer vaccination with bovine virus at the expense of the city, village, or township, as the case might be.[57] Duties with respect to the control of dangerous communicable diseases are clearly set forth in Act No. 137, Laws of 1883.[58] The provisions of this act were incorporated in a circular and sent out by Secretary Baker whenever diphtheria, scarlet fever, or smallpox were reported to be present by the local health officer.[59]

[50] *An. Rep.* S. B. H., V, xxxii.
[51] *Loc. cit.*; *ibid.*, VI, xxxiii; *ibid.*, VII, xvii; *ibid.*, XIII, xxxii.
[52] *Ibid.*, V, xxxii.
[53] *Ibid.*, V, xxxv.
[54] *Ibid.*, VI, xxxiii; *ibid.*, VII, xvii; *ibid.*, XIII, xxxii.
[55] *Ibid.*, XI, 74.
[56] MacClure, *op. cit.*, p. 10; *An. Rep.* S. B. H., XI, 71.
[57] *An. Rep.* S. B. H., VII, 179.
[58] *Ibid.*, XI, 72.
[59] *Ibid.*, X, 362.

Another duty which fell to the health officer of this period (1877-1888) consisted in making out an annual report for the State Board of Health (see Sec. 8, Act No. 81, Laws of 1873, in Appendix).[60] After the law made it mandatory for cities, villages, and townships to appoint a health officer, the secretary of the State Board of Health sent each year blank forms and instructions for filling them out to local health officers for their annual reports.[61] Similar report blanks had previously been sent the clerks of the local boards of health since the establishment of the State Board of Health. These differed slightly from those sent the health officers, in that they did not request so extensive an account of causes of diseases and deaths.[62] Accompanying the circulars and forms was a blank for a copy of the record of diseases dangerous to the public health. These circulars and blanks were substantially the same year after year with few exceptions, depending on the prevalence of the major epidemic diseases. In years when they were more prevalent, the questions in the annual reports were more extensive regarding their spread and control. By sending blank forms to two members of the local boards of health, the State Board of Health was enabled to get a more comprehensive description of local conditions.[63] In cases where the reports of health officers or clerks were incomplete or inaccurate, or where they were unable to make a satisfactory report, printed postcards were sent them explaining their difficulties.[64]

The response to these reports was slow at first. Moreover, great difficulty was experienced by some health officers in filling them out properly, consequently necessitating much work on the part of Secretary Baker.[65] For some the task was made difficult because of poor cooperation of physicians or members of the local board of health. The following letter received by Dr. Baker from the city clerk of Grand Haven was characteristic of many others:

Recorder's Office, City of Grand Haven
February 2, 1880

Henry B. Baker, Esq., Secretary State Board of Health
Lansing, Mich.

Dear Sir:—It will be utterly impossible for me to send you anything in the

[60] *Ibid.*, IX, ix.
[61] *Ibid.*, VIII, ix; *ibid.*, XII, viii.
[62] *Ibid.*, VI, xiii.
[63] *Ibid.*, VII, ix.
[64] *Ibid.*, VI, xiv.
[65] *Loc. cit.*

shape of an official report, for the reason that our board of health have utterly ignored the laws of the State relating to sanitary matters; we have had a great number of cases of diphtheria, scarlet fever, and measles in our city during the year 1879, but not reported to the board of health as far as I know.

Very respectfully,

THOS. F. HOWE, City Recorder[66]

In 1878, Dr. Baker wrote, "On the whole the character of the reports received was greatly improved over those for the year 1877."[67] In 1878 it was reported that four hundred and twenty-eight annual reports had been received from health officers of the state.[68] In 1880 the records reveal that two hundred and forty-four more annual reports were received by Secretary Baker from both health officers and clerks of local boards of health during the fiscal year than during the previous year.[69] This tendency towards improvement in returns is reflected in all of the succeeding years under consideration.

DUTIES OF LOCAL BOARDS OF HEALTH

Prior to the enactment of Act No. 56, Laws of 1877, making the employment of health officers mandatory for local boards of health, very little work was done by members of these boards other than attending to cemeteries and providing for the burial of the dead. Members of local boards of health were inclined to take little interest in their official work and were handicapped by the fact that they had only their personal experiences and limited observation to guide them. At best, so we are informed, there was little contact by members with other boards of health.[70]

To counteract this condition, the State Board of Health in April, 1874 distributed a circular to all presidents of local boards of health in the state setting forth their duties, proper proceedings in case of outbreak of contagious disease or infectious disease, and giving information concerning disinfection.[71] By an act of the legislature in 1879, the section of the statute (Sec. 1740, Compiled Laws of 1871), which authorized the mayor and council of cities and villages to act as a board of health, was amended to read as follows:

[66] *Ibid.*, VIII, 129.
[67] *Ibid.*, VII, xi.
[68] *Ibid.*, VI, ix.
[69] *Ibid.*, VIII, xii.
[70] *Ibid.*, I, 30.
[71] *Ibid.*, II, xi.

(1740) Sec. 49. The mayor and alderman of each incorporated city, and the president and council or trustees of each incorporated village in this State, in which no Board of Health is organized under its charter, shall have and exercise all the powers, and perform all the duties of a board of health as provided in this chapter, within the limits of the cities or villages, respectively, of which they are such officers. The provisions of this chapter, and the amendments thereto, shall, as far as applicable, apply to all cities and villages in this State, and all duties which are, by the provisions of this chapter, to be performed by the board of health of townships, or by the officers and inhabitants thereof, shall in like manner be performed by the board of health and the officers and inhabitants of such cities and villages, with a like penalty for the non-performance of such duties, excepting in cases where the charters of such cities and villages contain provisions inconsistent herewith.[72]

This act brought all portions of the state within the jurisdiction of some board of health, thus overcoming a difficulty previously encountered in those cities whose charters made no provision for such boards.[73]

From time to time the State Board of Health published rules and regulations recommended by its members for the use of local boards. Most of these were based on the laws of 1871, or amendments thereof, as well as on the opinions of board members.[74] The Hon. LeRoy Parker, in particular, was extremely active in the preparation of extensive papers on this subject,[75] and Dr. Hitchcock also made frequent comments on the matter. For his second annual address, Dr. Hitchcock chose as his subject, "Local Boards of Health, The Necessity for, the Proper Constitution, Status, Functions, and Relations of Local Boards of Health within our State."[76] This address was widely circulated about the state in response to repeated inquiries on the subject.[77]

Members of Boards of Health

The membership of boards of health in townships consisted in 1871 of a supervisor and four justices of the peace.[78] As amended

[72] *Ibid.*, VII, xviii. [73] *Loc. cit.*
[74] *Ibid.*, VI, liii; *ibid.*, III, xvi; *ibid.*, XI, 68.
[75] *Ibid.*, XI, xlii; *ibid.*, VIII, xxxviii.
[76] *Ibid.*, III, 7. [77] *Ibid.*, IV, x; *ibid.*, III, xix.
[78] See appendix, p. 324; in cities and villages, the mayor and aldermen were designated as boards of health. (See appendix, p. 332.)

by Act No. 56, Laws of 1877, the township board became the regular board of health thus enabling the two boards to meet as one:

(1692) Section 1. In every township the township board shall be the board of health. The supervisor shall be the president, and the township clerk shall be the clerk of said board. The clerk shall keep a record of the proceedings of the board in a book provided for that purpose at the expense of the township.[79]

Dr. Baker had other ideas concerning membership on boards of health. "One way in which physicians may be of greater use to the people," he said, ". . . is as members of local boards of health." [80]

City Health Administration

In 1880, Dr. Baker declared on one occasion, "Never yet has the public health service of Detroit, Bay City, Adrian, Jackson, or indeed of any city in Michigan been properly organized for effective and complete work in all branches of the service." [81] As has already been pointed out in previous chapters, boards of health in Michigan cities prior to 1877 were of the quasi-official type having no particular assigned duties or regular program. The actual sanitary work was left to sanitary police. "The most effective means the city has probably ever had for the removal of deleterious influences," said Dr. J. H. Mulheron of Detroit in 1881, "has been the sanitary squad of the police department, but when it is considered that this squad is composed of men who have no scientific training, it is not to be wondered at that it has never regarded anything deleterious which does not smell bad." [82]

[79] *An. Rep.* S. B. H., XI, 67.
[80] *Ibid.*, I, 16.
[81] *Ibid.*, VIII, 129.
[82] *Mich. Med. News.*, IV (1881), 161; on November 24, 1865 a committee of the Detroit Board of Health with Dr. Zina Pitcher as chairman proposed that a City Dispensary be established "as a means of supplying the indigent population of the city with medicines and medical attendance. . . . Such a system," it was claimed "well administered would be of great value in the time of prevailing pestilence, and would also be the best and most economical mode of providing for the medical wants of the indigent portion of the population at all times. One function of the dispensary is to vaccinate the poor and preserve pure vaccine matter for general use" (*Det. Advert. and Trib.*, XXIX [1865], 1).

The quasi-official boards of health which were organized at various times in the history of Detroit were powerless to bring about sanitary reform despite the fact that the medical profession had individually and collectively called attention to the evils in existence. The board of health rarely took cognizance of anything likely to affect the health of its citizens other than to correct such nuisances as were offensive to the senses.[83] However, it is reported that at a meeting of the Common Council of Detroit on Dec. 3, 1865, an ordinance, reported by the city attorney was adopted, enlarging the duties of the board of health so as to give it power to compel parties to "cleanse infected houses and premises."[84] An impending cholera epidemic served to assist the board of health in carrying out this program.[85]

In 1880, Detroit was reputed by some to excel in the salubrity of its climate and in the health of its citizens. An editor of one of Detroit's leading newspapers wrote, "It is doubtful if any board of health, however elaborate and costly, could at present improve the public health of so healthy a city. While, therefore, we may be compelled to have a health officer, as the law seems to require, to report our vital statistics to Lansing, the common council should take care that he cost as little as possible, and meddle as little as possible with the people's private affairs."[86]

Officials of the city of Detroit were often unable to comply with the public health laws of the state because of the reluctance of city officials to establish a full-time health department. At the sanitary convention held in Detroit in 1880, it was declared more difficult to get health reports from this city than from any other city in the state.[87] On Feb. 2, 1880 the assistant city clerk of Detroit wrote as

[83] *Loc. cit.*

[84] *Det. Advert. and Tribune,* III (1865), 1.

[85] *Loc. cit.*

[86] *An. Rep.* S. B. H., VIII, 125; in 1878, Dr. William Brodie, editor of *Michigan Medical News* wrote, "There is still another cause of good health which is not to be sneezed at, although it is we fear not properly appreciated, and that is our efficient(?), mirabile dictu, Board of Health, which meets regularly as clockwork every two weeks and votes that the city is healthy, for this advice an ungrateful population allows it but $1.50 per member." (*Mich. Med. News,* I [1878], 1.)

[87] *An. Rep.* S. B. H., IX, 141.

follows to Dr. Baker, explaining his inability to supply him with the proper reports:

City of Detroit, Clerk's Office,
Feb. 2, 1880

Secretary of the State Board of Health:

Dear Sir: Forms for making reports of Board of Health your office received. The Board of Health of Detroit have not met during the past year, so I am unable to give the information requested. It is probable that they will hold no more meetings.

Yours respectfully,

Harry S. Starkey,
Ass't City Clerk.[88]

A subsequent letter from this same person stated that there was no clerk of a board of health, no board of health, and no health officer.[89] Apparently others in the city were aware of what had happened for it is recorded that Mr. F. G. Russell, City Attorney of Detroit, wrote Dr. Baker in July of the same year calling his attention to the lack of a health officer or a board of health in Detroit.[90] This led the State Board to take steps which ultimately led to the creation of a board of health for that city. At a meeting of the State Board in July, 1880, a committee was appointed to act upon the letter of Mr. Russell, to endeavor to perfect a plan for an efficient board of health for Detroit, and to urge upon the city authorities the desirability of adopting such a plan. Drs. Henry F. Lyster and Henry B. Baker were named to the committee.[91]

At the Flint Sanitary Convention the following year, Dr. Lyster read an extensive paper entitled, "A Plan for a Board of Health for the City of Detroit." This proposed plan of organization included one health officer, four assistant health officers, one executive officer (sanitary engineer), one clerk, and four employees.[92] He later incorporated the ideas presented in this paper in a bill which was introduced into the legislature. This, however, was displaced by another measure known as Act No. 399, Local Acts of 1881—An Act to Provide for the Establishment of a Board of Health for the City of Detroit.[93]

[88] *Ibid.*, VIII, 128.
[89] *Loc. cit.*
[90] *An. Rep.* S. B. H., VIII, xlv.
[91] *Loc. cit., ibid.*, IX, 54.
[92] *Ibid.*, IX, 54.
[93] *Loc. cit.*; *ibid.*, IX, xxxix.

This latter bill was approved May 26, 1881 and went into immediate effect.[94] Dr. O. W. Wight was named Detroit's first health officer.[95] In securing legislative action, the State Board of Health was assisted by others in the state who were interested in getting Detroit officials to see the error of their ways. At this same convention the following resolution was offered by Dr. I. N. Smith of Saginaw, which aided materially, so it is said, in influencing the legislature later in the year:

> Whereas, The City of Detroit occupies the position from its size and location of the metropolitan city of Michigan, and is in constant communication with all portions of the State,
>
> Resolved, That it is the sense of the convention, that the interests of the health of the State require that an intelligent supervision of contagious diseases and their origin and source be instituted and established in the city of Detroit.
>
> Resolved, That we regard the position of Detroit in this matter as quite exceptional not only to that of all other large cities, but also to all the other cities of Michigan.[96]

The law creating the Detroit Board of Health stipulated that it was to consist of three members who received their appointment from the mayor subject to the approval of the common council. The board in turn appointed a secretary, who was in addition named health officer of the city, receiving a salary of $3,000 per annum for his services.[97] The complete organization of the Detroit Board of Health took place on November 14, 1881.[98]

In July of the following year an extensive report prepared by the health officer, Dr. O. W. Wight, made its appearance. It contained two hundred and seventy pages of material.[99] Commenting on its contents, the editor of the *Detroit Lancet* remarked that, "for the first time in its history, Detroit has a board of health and a health officer worthy of the name. It is somewhat remarkable that now for the first time in history extending into the misty past, we have an authentic report of matters pertaining to the health of Detroit. . . .

[94] *Mich. Med. News*, IV (1881), 101.
[95] Burr, *op. cit.*, 679.
[96] *An. Rep.* S. B. H., IX, 68.
[97] *Ibid.*, IX, 61.
[98] *Ibid.*, XI, 84.
[99] *Mich. Med. News*, V (1882), 257.

We could wish for every city as competent a health officer as Dr. O. W. Wight." [100] The editor of the *Medical Times and Gazette* of England said of this volume, "We have before us the first annual report of the newly constituted Board of Health of Detroit, Michigan, U. S., a volume which has given us as much amusement as instruction. . . . The burning question of the notification of infectious diseases has been solved with a rigor not surpassed by the Dutch law." [101]

County Health Administration

Although county health administration was not to make its appearance in Michigan until 1928, the credit for advancing the idea of such an administrative health unit belongs to Dr. O. W. Wight, Detroit's first health officer. From available accounts, it is learned that Dr. Wight read a paper on "A Proposed Plan of Public Sanitation" before the twenty-first annual meeting of the State Medical Society in 1886 at Jackson. In this paper he advocated a change in the sanitary system, then existent in the state, from the township health until to the county health unit.[102] It was his claim that the township sanitary unit was "almost worthless," as he expressed it.[103] "The only remedy," he said, "is to enlarge the territorial unit of sanitary administration, so that a health officer may be employed who can give his entire time and energy to his official work." [104] It was also his opinion that such units should be supported by public taxation. "Of course," he said, "there are some counties in the state, the revenues of which would be too small to maintain a full sanitary corps. In some counties it would be necessary for the health officer to work single-handed. In a few instances it might be necessary for two counties to combine in order to employ a health officer at all." [105]

As the result of Dr. Wight's paper, a committee on legislation was formed from the State Medical Society to make recommendations accordingly to the legislature.[106]

[100] Burr, *op. cit.*, p. 679.

[101] *Mich. Med. News, op. cit.*, p. 292; on June 9, 1886, Dr. O. W. Wight stated that "Sanitary administration in this country is almost unknown outside of the larger cities." (*Trans.* M. S. M. S., VI [1886], 264.)

[102] *Loc. cit.*

[103] *Ibid.*, p. 270.

[104] *Ibid.*, p. 266.

[105] *Ibid.*, p. 270.

[106] *Ibid.*, p. 9.

Nuisances

Boards of health in both cities and rural areas were required to examine into all nuisances, sources of filth, and causes of sickness that might in their opinion be injurious to the health of the inhabitants, and to destroy, remove or prevent the same as the case might require, according to Sections 1694 and 1695 of the Compiled Laws of 1871.[107] To prevent any misunderstanding by the people, boards of health were required to give notice of their regulations, by publication in a newspaper or by posting notice of same in some conspicuous place, according to Section 1698 of the Compiled Laws of 1871.[108] Township boards of health were given the power and duty of making regulations respecting nuisances, sources of filth, causes of sickness and concerning articles capable of causing or conveying infection or contagion (Sections 1694 and 1695 of the Compiled Laws of 1871).[109] When nuisances were found on private property, boards of health were expected to notify the owner or occupant to remove the same at his own expense within twenty-four hours, or pay a sum not exceeding one hundred dollars.[110] For further account of definitions of nuisances and penalties levied for non-removal of same during the period under consideration, the reader is referred to Howell's *Annotated Statutes.*

[107] *An. Rep.* S. B. H., XI, xl.
[108] *Loc. cit.*
[109] *Loc. cit.*
[110] *Loc. cit.*

TEXTS AND DOCUMENTS

THE CHOLERA IN PEST, 1831

HENRY MILLER MADDEN

The great epidemic of cholera, which had penetrated Russia in Asia in 1823, continued to spread westward, reaching Russian Poland in April 1831. The disease was reported in the county of Heves, on the Alföld east of Pest, as early as 2 June. By 5 August 333 communities reported 11,987 cases of cholera, 4876 of them terminating fatally. Nine months later the disease had been contracted by 536,517 persons; there had been 237,614 deaths. One thousand fatalities accompanied the daily average of 2235 cases. During the summer months there were some days when 3000-3500 deaths were reported from the 5000-6000 cases.

The epidemic was combatted by a number of means, most of which are mentioned in the following proclamation. In general, the methods employed were based upon the Russian system outlined in *Anweisung zur Heilung der Cholera morbus, vom kaiserlichen Medicinalrath in St. Petersburg verfasst* (1823), an adaptation of which was published by Dr Pál Antal Bugát under the title "A cholera Oroszországban hivatalos tudósitások szerint" in the *Orvosi tár* of 1831. Dr Bugát (1793-1865) had already established his scientific reputation by the introduction of Hungarian terminology into the medical sciences. The general direction of the quarantine and therapeutic program was entrusted to the eminent physician Dr Mihály Lenhossek, Protomedicus for Hungary. Lenhossek was born at Pozsony in 1773, and died at Buda in 1840. He wrote two treatises to summarize the contemporary knowledge of cholera and its treatment: *Animadversiones circa curandam choleram orientalem et alios epidemicos morbos in Regno Hungariae nunc vigentes* (Buda, 1831) and *Kurzer Unterricht, wie man sich gegen die morgenländische Brechruhr zu verwahren, und was man bei dem*

ersten Anfalle dieser Krankheit bis zur Ankunft eines Arztes zu thun habe (Pest, 1831). The former was translated into Hungarian, German, and Italian.

The German terms used to describe the disease afford an interesting sidelight on contemporary medical opinion; cholera was known as "morgenländische Brechruhr, orientalische Brechruhr, ostindische Brechruhr, epidemische Brechruhr, Brechdurfall, Brechkolik, Gallensucht, Gallenruhr, Gallenfluss." The Hungarian terms, coined during the infancy of Hungarian as a scientific language, are no less revealing: "epemirigy, görtsmirigy, kéklő bélgörcs, gyilkoló dögletesség, keleti hányszékelés, napkeleti ragadós epekórság."

An indication of the nature of the therapy is given in the following list of medications used in the county of Csanád:

Specificatio medicamentorum, quae in usus Inc. Cottus Csanadiensis appropinquante nunc epidemia Cholerae Orientalis necessaria sunt.

Nomina medicamentorum	Libras
Chloratis Calcis, in quo plenarium fere defectum patimur.....	300
Champhoreae	10
Opii puri.....	5
Herbae Melissae.....	50
Herbae Menthae Crispae.....	20
Nitri puri.....	30
Radicis Angelicae.....	20
Radicis Ipecacuanhae	2
Radicis Colombo.....	3
Salis Ammoniaci depurati.....	20
Farinae seminum	30
Radicis rhei moscoviti.....	4
Arcani duplicati.....	4

Even the hydropaths took a hand. The cry "Victoria! Kaltwasser hat die Cholera besiegt!" testified to their faith in the success of the water cure.

The most recent brief history of the Hungarian cholera epidemic of 1831 is by István Bálint Nagy. "Az első cholerajárvány története és gyógymódja," in *Orvosi hetilap*, 75 (1931), 1217-19, 1233-35. A bibliography is appended to this article.

Verhaltungs-Regeln,
welche
sämmtlichen Bewohnern der kön. Freystadt Pesth
im Allgemeinen empfohlen werden.

Bereits sind in Gemäßheit hoher Verordnungen dem Eindringen der morgenländischen Brechruhr (Cholera morbus) sowohl durch Aufstellung eines Cordons, als auch durch Errichtung einer sich von Stunde zu Stunde der Vollkommenheit nähernden Contumaz-Anstalt (für Menschen, Vieh und Waaren) die kräftigsten Dämme entgegen gestellt worden, dennoch wird es denen Bewohnern dieser königl. Freystadt nicht unwillkommen seyn, vorläufig Verhaltungs-Maßregeln zu vernehmen, deren Beobachtung selbst im schlimmsten Falle für Jedermann wohlthätig seyn dürfte.

1. Hoffnung und Glaube an Gottes schützende Allmacht bleibt nun und immer unser heiliger unerschütterlicher Anker; an Ihn reihe sich die für diesen Augenblick nicht genug zu empfehlende

2. Liebe des Nächsten;—sey er noch so gering,—noch so arm,—sein Name ist Mensch!

3. Ruhe des Gemüthes, Verbannung schädlicher und nutzloser Angst wird von den Einwohnern dieser Stadt um so leichter gewonnen werden können, wenn Sie die rastlose Thätigkeit sämmtlicher Behörden zur Abwendung der Gefahr unbefangen beobachten, und wenn Sie denen Einflüsterungen müßiger oder übelwollender Menschen kein leichtgläubig Ohr biethen; dafür ist aber

4. strenge Folgsamkeit, und Ergebung in alle medicinisch-polizeylichen Verfügungen ohne allen Unterschied des Standes, Vermögens, Alters und Geschlechts, durchaus unerläßlich, wenn auch manche Verordnung für den ersten Augenblick lästig, drückend, vielleicht überflüssig erscheinen sollte.—

5. Den Körper behandle man so, daß demselben so wenig als nur immer möglich Empfindlichkeit zur Aufnahme des Ansteckungs-Stoffes bleibe, daher wird gerathen:

a) Daß man die gewohnte Lebensweise (wenn dieselbe zweckmäßig eingeleitet war) nicht ändere, in keinem Falle aber allzu plötzlich umwandle.

b) Mäßigkeit in Genüßen jeder Art, eben so in der Arbeit, Bewegung und Nachtwachen bleibt unabänderlich das sicherste Mittel, sich jederzeit vor bösen Einflüssen zu bewahren.

c) Die Kost sey einfach und gesund; darunter werden begriffen: gut bereitete frische Fleischspeisen, nicht allzuhäufig Gemüse und Hülsenfrüchte, noch viel seltner geräuchertes und gepöckeltes Fleisch und geräucherte Würste. Von Fischen müssen nur solche angeschafft werden, welche noch leben, eben so Krebse, Wild wird genossen, ehe es der Verwesung unterliegt, Butter und Schmalz bewahre man vor dem Ranzigwerden; unreife Kartoffeln, faule Eyer schaden—guter Reis nicht. Das Brod sey gehörig gebacken, bedeutender Zusatz von Bierhefe (Germ) schadet hier und überall, allzufette Speisen, oder mit Salz, Gewürz, Zwiebel und Knoblauch zu sehr überladene, meide Jedermann, nicht minder Schwämme.—Derjenige, dem Obst sonst gut bekam, versage sich für den Tag e i n e Gattung Obst nicht, nur wähle er stets reifes. Aprikosen (Marillen), harte Birngattungen und Melonen sind minder lobenswerth; auch muß vor dem übermäßigen Gebrauch der Gurken gewarnt werden.

d) Aus denen Getränken entscheide sich Jedermann seiner Erfahrung gemäß für dasjenige, welches seiner Gesundheit auch sonst am besten zusagte: gutes Wasser, ächter, mit Wasser gemischter Wein, gut gebrautes Bier, dem schwer arbeitenden Mann immerhin ein Glas Brandtwein,—doch mit unwiderruflicher Hinweisung auf die bewährte Erfahrung: vor Allen ist der Säufer das Opfer der gefürchteten und fürchterlichen Cholera.—Eis (Gefrornes), im Eis abgekültes Wasser, säuerliche Abgüße von Obst-Säften genieße man mit Vorsicht.—Als Frühstück (denn nicht wohl gethan ist's, nüchtern auszugehen) taugen für Gesunde Coffee, Ciocolade, Suppe, Thee, ein Gläschen Sliwowitz, Liqueur, Borovitska, oder Brandtwein.

c [sic]) Reinlichkeit!! diese ganz allein gehörig beachtet, wird viel und großes Unheil verhüthen. Man wechselt Wäsche, wäscht

oder lüftet die wenige so man hat; man ändert, oder durchklopft, bürstet und lüftet seine der Jahreszeit so viel als möglich angemessene Kleidung; man bedient sich keiner fremden, oder blindlings angekauften schon gebrauchten Kleidungs-Stücke; man reinigt das Bett, oder die Lager-Stätte.—Der Körper wird öfter trocken mit Tüchern gerieben, oder gewaschen mit lauen Wasser. Erlaubte Zusätze sind: Seife, gewöhnlicher, oder Räuber, oder Holz-Essig, Kampfer-Spiritus Chlor-Auflösung (2 Loth Chlor-Kalk zu einem Seidl Wasser.)

f) Die Wohnungen der Menschen verdienen ganz besondere Rücksicht, dieselben sind täglich zweymal dem Luftdurchzuge zu öffnen, jeden Tag wird ab- und ausgekehrt, bey trockenen Wetter wird aufgewaschen (mit Aschen-Lauge, oder Chlorkalk Auflösung.) Das Uebertünchen mit Kalk darf nicht gar zu oft vorgenommen werden. Küchen, Speisen, Keller, Böden, Ställe, Schupfen sind öfter zu öffnen, und rein zu halten. Unrath, excremente etc. etc. werden sorgfältig, und zwar aus jeden Hause, jeder Wohnung so entfernt, daß sie andern Menschen nicht schädlich werden können.—Es taugt nichts, wenn allzu viele Menschen in einen Behältniß wohnen, ebenso wenig ist es zu billigen, wenn zwey, oder mehrere Menschen in einen Bette schlafen.— Thiere dürfen durchaus nicht im Zimmer gehalten werden.— Handwerker, welche in der Atmosphaere schädlicher Dämpfe zu leben haben, müssen alle diese Vorsichts-Maßregeln verdoppeln.— Erkältung schadet ganz besonders, daher schläft man (bey den häufigen plötzlichen temperatur Wechsel) minder sicher, wenn die Fenster Nachts offen gelassen werden; nicht daran gewöhnten bekömmt das Schlafen unter freyen Himmel leicht sehr übel.— Zur Räucherung der Zimmer können brennendes Wachholder-(Kronowet) Holz, Wachholder-Beeren, Essig, auf warme (nicht glühende) Unterlagen gegoßen, vor allen aber die mineralischen Räucherungen empfohlen werden; Unterricht darüber, wie diese letzt genannten zu machen giebt jeder Apotheker, Wund-Arzt, oder Arzt. Die ganz mittellose Classe von Menschen erhält das material zu denen Räucherungen bey den Hrn Hrn Districts-Commissairen unentgeldlich.

g) Selbst gewählte, oder nicht genügend erprobte Praeservative (unter welchen immer Namen) sollen nie ohne Zuziehung ärtzlichen

Rathes gebraucht werden: eben dieses gilt von den eigenmächtigen Aderlassen. Zu häufiges warmes, oder kaltes Baden, allzu häufiges Tabakrauchen werden leicht schädlich, der mäßige Gebrauch von beyden aber ist sehr empfehlungswerth.— Jedes probehältige Bewahrungs, oder Heilmittel wird ungesäumt bekannt gemacht werden.— Bey jeden vorfallenden Uebelbefinden frage man den Arzt, oder Wundarzt um Rath, eben so der praeservirung wegen.— Menschen welche die Nähe von Kranken scheuen, sollen so viel als möglich selbe zu besuchen unterlassen; diejenigen, welchen Kranken-, oder Spital-Besuche obliegen, sind meistens schon an sich selbst der Einwirkung des Ansteck-Stofes weniger unterworfen, aber auch Sie können sich durch fleißiges Waschen, Lüften, Durchräuchern, Riechen, und tragen des Chlor-Kalks, oder Chlor-natron's vor Ansteckung bewahren.

Sign. Pesth den 12ten July 1831.

Durch die
für die kön. Freystadt Pest aufgestellte Sanitaets Commission.

NOTES AND COMMENTS

A FOOTNOTE TO A *HISTORY OF THE SMALL POX*

CHARLES F. MULLETT

During the first half of 1815 Dr. James Carrick Moore (1763-1834) was putting his extremely learned and interesting *History of the Small Pox* through the press.[1] In this work Moore traced the origin, dispersion, and treatment of the disease, leaving no dust undisturbed in his effort to relate the truth concerning "the most fatal contagion that ever infested the earth." Additional evidence of his thorough search appears in a brief correspondence with the industrious Irish antiquary and ecclesiastic, Charles O'Conor (1764-1828), who was also librarian to the Marquis of Buckingham at Stow.[2] O'Conor, despite the errors in his varied and numerous writings,[3] was a learned individual who never hesitated to express positive opinions, whether the subject was the position of Catholics under the penal laws, the early history of Ireland, or the diseases of primitive peoples.

Moore, brother to the better known Sir John Moore of the Peninsular War, had been born in Glasgow and had studied medicine at Edinburgh and London. His earliest publication, the first of many, appeared in 1784 on *A Method of Preventing or Diminishing Pain in Several Operations of Surgery*. Later on, he defended Jenner to whom he dedicated his *History of the Small Pox*; two years after the appearance of the *History*, he published *The History and Practice of Vaccination*. His experience and interests were far broader

[1] London, 1815.

[2] Stow Papers, Huntington Library. The letters are here reproduced with the kind permission of the Library authorities; a few contractions have been expanded, but otherwise the letters are printed as written. I am indebted to the Research Council of the University of Missouri for assistance in preparing these documents for publication.

[3] O'Conor's chief antiquarian works are *Annals of Tighearnach*, *Annals of Ulster*, and *Annals of the IV Masters*. Critics have found his texts full of errors derived from his ignorance of grammar and topography. Unfortunately, none of his letters to Moore seems to have survived.

than the average. He was Director of the National Vaccine Establishment; he helped to expose quack medicine; he paid much attention to medical chemistry; and he served with the army in Ireland in the '98. This last perhaps contributed to his correspondence with O'Conor.

Although no attempt to survey thoroughly Moore's career and writings is necessary here, his learning and general viewpoint may justifiably be emphasized.[4] *The History of the Small Pox* is a distinguished book by any standard of medical history. The critical apparatus—used, not merely tacked on—illustrates the scholarship; the incisive observations reveal the higher learning. For every period covered he drew his materials from original sources, many of them quite obscure to any but a specialist, and from the best secondary accounts available. He was keenly aware that many writers tended to interpret certain words and phrases equivocally in order to prove a point. His comment on the aridity of many medieval chronicles bespeaks both a knowledge of the chronicles themselves and a realization of their deficiencies. He displays sound acquaintance with Arabic medicine and its exponents. His disapproval of the charlatan in Paracelsus in no way blinded his appreciation of that bizarre figure's signal contributions. At no time did Moore hesitate to criticize his sources or to engage in well-mannered controversial asides concerning this or that theory of his subject. He neither generalized beyond the substance of his sources nor attempted to hide his ignorance behind pompous pronouncements.

In the fourth chapter of his *History*,[5] treating the diffusion of smallpox throughout Europe, Moore observed that no one would have expected that the earliest accounts of smallpox having reached Europe would be found in Ireland. Yet O'Conor, in "elucidating the history of that island, by the contents of an immense heap of Irish manuscripts in the Bodleian, and in the library of the Marquis of Buckingham, has found traces of that disease there." The *Annals of Ulster* stated that a grievous leprosy, "which in Ireland is called

[4] The only formal life is R. Anderson's *Life of James Moore M.D.* (Edinburgh, 1820). The D. N. B. relates nothing about his practice beyond the statement that he ceased practicing in 1825. Another brother was Admiral Graham Moore.

[5] See especially pp. 83-86.

Bolgach," had occurrred in 679, and again in 742. Brian's Irish dictionary translated "Bolgach" as small pox, its plural "Bolgaidhe" as blisters.

Moore did not believe that smallpox had reached Ireland in 679 "which was thirty years before the invasion of Spain by the Moors. That the disease should have been conveyed there towards the middle of the eighth century, was not impossible; for the intercourse between Ireland and the continent was not inconsiderable even in the sixth." The activity of Irish scholars on the continent might account for an early importation, yet O'Conor's arguments were not convincing. "Bolgach" might originally have been leprosy and later on applied to smallpox. "It is, perhaps, some confirmation of this conjecture that in the fourteenth century, when the Small Pox was generally diffused, it is then mentioned in these Irish chronicles by the term Galra breac, literally the speckled disease; the name which it has retained in Ireland to the present day." *

The correspondence with O'Conor, all too brief and incomplete, supplies no more than a footnote to his work, but as such it enhances respect for the author and leads to the feeling that, in common with so many secondary figures in medical history, Moore would well repay substantial analysis.

Conduit Street
January 17, 1815

Sir

Colonel Stanhope has transmitted to me your extracts from the Annales Ultonienses, for which I return you many thanks: they are most important for the elucidation of my History of the Small pox, which I am about to publish.

The Pestis and the Mortalitates which occurred in the years 553, 555, and 663, were I am persuaded not the small pox but plagues. The French and German Chronicles are filled with accounts of the

* The supporting passage, from *The Annals of the IV Masters,* runs: "Fergal the son of Dermot, Chief of Moylurg, lion of the nobility, and the most dexterous in arms of all his sept: and Tomaltach the son of the said Fergal son of Dermot, Tonast of Moylurg, died of the Galra breac (Small Pox) in 1368 . . . William the Saxon, son of Redmond (Sir Edmund) Burke, heir of the Mac Williams, died of the Galra breac (Small Pox) in the island Cua." *History of the Small Pox,* pp. 85-86.

plague in these and the following centuries. The disease was called Pestis Inguinalis sometimes: and there was another malady frequent in these ages called Pestis Ignis, a violent species of Erysipelas.

The Irish words as quoted and translated by you, do not appear to allude to the Small pox.

But the disease which occurred in 742, you state as named "In Bolgach" and that this word really according to Irish authorities means Variolae. This is most important and I presume may be considered as authentic. I have traced the Small pox to Spain and France in the 8th Century, but I did not imagine it could have reached Ireland so soon as 742. By what channel could it have come? There was probably little or no commercial intercourse. But perhaps Plunderers from Normandy contaminated Ireland at that early period. If there was then any intercourse with Spain or the Mediterranean coast, there would be no difficulty of explaining the matter.

I regret that you have not given a full Extract of the passage containing *In Bolgach*. I suppose this word is not found earlier than 742.

I take the liberty of asking what the Mss. is? By whom written (if this is known) and of what age? I suppose it is a Monkish production much later than the times of which it treats.

I have taken the liberty to solicit My Lord Buckingham to send it to his house in town, that I may have the opportunity of inspecting it. I hope I have made no improper request, and if His Lordship consents, perhaps you will have the goodness to put paper marks in the places you have quoted, unless the year shows the places easily.

I must repeat my obligations to you for finding out and communicating to me information which will be a great ornament to my Work. I must take the liberty of using your name in the quotation, and perhaps you will have the goodness in reply to aid me still farther.

I was about to print, but I shall delay till I have got the Extracts completed.

I have the honor to be

Sir, your most obedient and most obliged
humble Servt

JAMES MOORE

Conduit Street
January 20th, 1815

Sir

I have this moment had the honor of receiving your obliging letter, the contents of which are most important to my work. It is singular that by so unexpected a means that the truth of my History of the Small pox should be confirmed.

I am anxious to receive the two passages respecting the small pox at length, written as for the press with the title of the work so as to give complete authenticity to them. The date is of course important.

If I understand you distinctly, the Annals of Tigernach, the Chronicles of Flora and Malmura all wrote on vellum are in the Marquis's Library. The former died in 1088, the date of the latter is the 9th Century.

And the Annals of Ulster founded upon the above, and of course more modern are in the Bodleian Library Rawlinson's 488.

If this is not the case, pray correct me. It will of course be better to quote the oldest work.

I thank you for the authorities respecting the intercourse between Ireland and the Continent. I shall examine them in the British Museum.

I hope you will forgive my solicitation and the trouble I give you. I shall postpone the printing of my work, until your quotations reach me.

I beg to present my respects to the Marquis of Buckingham, and I have the honor to be, Sir

If there is any Irish in the quotations, a translation will of course be wanted.

Conduit Street
January 30th 1815

Sir

Your letters have afforded me very great pleasure. I have studied and compared them together, and I shall venture to express to you my impression on that obscure point of History.

The Jaundice is neither an infectious nor ever an Epidemic dis-

order. It never possessed these dispositions according to all medical authors: I must conclude from this, that the disorder that in the 7th and 8th Centuries ravaged Ireland was not what medical men term the Jaundice.

There is an Epidemic, and Infectious Fever named by moderns the Yellow Fever. This might have been called by Historians Jaundice; but this disease though it infests occasionally the countries on the borders of the Mediterranean, and America, was never known to occur in the British Islands. I therefore can not believe that *Buidhe conaille* meant the yellow fever.

To deny is easier than to establish an opinion, therefore my difficulty is now come.

You mention that the Irish words import *a yellow scab*: and you also inform me that Bolgach according to Brian is Small pox in the singular; and has a plural *bolgaidhe blisters*. The singular Bolgach should therefore mean *one pustule or tumour*.

If I am correct the disease meant was one which had a single swelling of yellow colour.

This you perceive could neither be Jaundice nor the Small pox: what it was is the question. In the Plagues which raged in the Continent in the same Centuries, the disease is sometimes named *Pestis inguinalis*; the words *glandula* and pustula are sometimes used: which means what Physicians consider to be the True Plague, in which there are usually *one* or *two* swellings, buboes, or tumours.

I own to you that I suspect the malady in Ireland was the Plague, and the yellow scab, or Bolgah, alluded to the attending buboe.

There is however many difficulties in my explanation, and perhaps you can refute it.

I regret that you have not found the passage respecting *Galra breac*: as that literally means small pox now, there can hardly be a question of admitting it. And therefore I feel particularly anxious respecting the time when that disease first appeared in Ireland. I fear I can make no use of the other great and curious materials, as they are foreign to my work, which must be confined to researches on the Small pox.

I am impatient to see your book which has not yet reached me, and I have enquired in vain at booksellers for it.

The trouble you have taken in writing so much to a stranger demands my warmest acknowlegements, but should you hit upon *Galra breac*, I shall be infinitely obliged to you for all that occurs upon that subject which I suppose was formerly as now the Small pox.

I have the honor to be, Sir

Conduit Street
March 11, 1815

Dear Sir

You took so much trouble in replying to many of my requests that I became ashamed to trouble you further. My work on the Small pox is printing slowly: they proceed so tardily, that I do not believe they will reach that part relating to Ireland before the end of next week, or rather the beginning of the week which follows the next.

If in that time you could put your investigating finger on the passage relating to the *Galra breac*, it would be a valuable quotation for me. Should you find it, it will require to be translated, and the proper additions for printing to mark the place and time, &c in order to shew its authenticity to those who are ignorant of the manuscripts.

If you find it impossible to hit upon the passage, you may recollect the Century in which that disease prevailed in Ireland.

I am tempted to give you this trouble as your work has convinced me of our consanguinity. You are, I suppose, a descendant of the Irish Scoti, and I spring from those Scoti who settled in North Britain. And as I am now investigating the sufferings of the Scoti of the 7th, 8th, and 9th Centuries, it is very possible that the same Scotus was our

[Incomplete]

No. 11 Conduit St.
March 23, 1815

Sir

I write to thank you very sincerely for the very entertaining letter respecting the brave heroe called O'More, who I wish to believe

was my progenitor: and also to express the very great obligation I feel for the trouble you have taken respecting the Irish manuscripts. I stopt the press to insert what I conceived applied to my work: if you had been more in reach, I should have consulted you with regard to the propriety of the extracts I have made, and the manner in which your name is introduced. But there was no time, and I hope you will not disapprove of the terms used.

I am fully persuaded that the word Conaill, does not allude to the small pox; and the quotations on that point are not inserted: as I consider them employed for another disease, of an uncertain nature. Bolgach I doubt of; but the passages are inserted; as well as an extract from those where Galra breac is used, which was doubtless the small pox. These extracts must be deemed curious and make a valuable addition to my work; in which I have collected everything I could find of moment respecting the early history of the small pox.

Every creature one meets is impatient for news: but nothing has, I believe, come today. Buonaparte pushes on to Paris, *all or nothing* has always been his maxim. He trusts to his popularity: but is this a solid foundation? I own notwithstanding the threatening aspect of things

[Incomplete]

Conduit St.
May 19, 1815

Dear Sir

Accept of this work, and also a thousand thanks for the trouble you took.

I have the honor to be Dear Sir,

MEDICO-HISTORICAL NEWS AND ACTIVITIES

CONSTITUENT SOCIETIES

The New York Society for Medical History

The Society held its April meeting at the New York Academy of Medicine on April 8, 1943. Dr. James Alexander Miller read a paper on "The American Anti-tuberculosis Movement" which was discussed by Dr. J. Burns Amberson, Frank Kiernan and George J. Nelbach.

The Johns Hopkins Medical History Club, Baltimore, Md.

The Club held its third meeting of the year on April 5, 1943 in the Lecture Hall of the Institute of the History of Medicine. The following program was presented:

"Benjamin W. McCready and the First American Treatise on Occupational Diseases, 1837".....MISS GENEVIEVE MILLER

"The Medical Aspects of the Controversy over Factory Conditions in New England, 1840-1850".....DR. GEORGE ROSEN, *New York.*

NATIONAL NEWS

The New York Academy of Medicine

An exhibition of over one hundred editions of the *Vicar of Wakefield*, by Dr. Oliver Goldsmith, has been opened in the Library of the New York Academy of Medicine, and will continue until May 15. This valuable collection was presented recently by Mrs. Lesta Ford Clay in memory of her father, Dr. Linsly R. Williams, a former Director.

Army Medical Library, Cleveland Branch

In commemoration of the quatercentenary of the founding of modern anatomy by Andreas Vesalius, an exhibit has been arranged in the display cases and on a near-by table in the reading room of the Cleveland Medical Library Association. This exhibit was prepared by the staff of the Cleveland Branch of the Army Medical Library, and the books are largely from its collection; but they include two important items from the collection of the Cleveland Medical Library Association. These are the copy of the second edition of the *Fabrica* (1555) presented to the Association in 1893 by Dr. Howard A. Kelly (who died in January of the present year); and a copy of the first edition of Geminus's compendium plagiarized from Vesalius in 1545.

All of Vesalius's works are represented in the exhibit, though not in every case by first editions. In the following list, the date of the first edition is

given, and when this is not the edition included in the exhibit, the date of the edition included is given in parentheses.

1. Paraphrase of book nine of the *Almansor* of Rhasis. Louvain, 1537. (Basel, 1537.)
2. Revision of the anatomy textbook of his former teacher, John Winter of Andernach. Venice, 1538. (1585.)
3. Anatomical Tables. Venice, 1538. (Maxwell facsimile, 1874.)
4. Epistle on blood-letting in pleurisy. Basel, 1539.
5. Contributions to the Juntine edition of Galen in Latin translation. Venice, 1541. (Vesalius revised the translations of Galen's works on the dissection of nerves, veins, and arteries, and on anatomical procedure.)
6. First edition of the *Fabrica*. Basel, 1543.
7. First edition of the *Epitome*. Basel, 1543.
8. German version of the *Epitome*. Basel, 1543.
9. *China Root Epistle*. Basel, 1546.
10. Second edition of the *Fabrica*. Basel, 1555. (Two copies.)
11. *Examination of Fallopio's Anatomical Observations*. Venice, 1564.

Besides these, there are two copies of the Geminus compendium, London, 1545; the first edition of Fallopio's *Observations*, Venice, 1561; a copy of the attack on Vesalius by his former teacher Jacques Dubois (1551, represented by 1635 reprint); and a copy of the rare Murr reprint (1790) of Servetus's *Christianismi restitutio* (1553), for which he was burned at the stake in Calvin's Geneva, and which contains the earliest account of the pulmonary circulation, perhaps arrived at when he was Vesalius's fellow-prosector at Paris about 1536.

Finally, there is a copy of *Andreae Vesalii Icones Anatomicae*, published jointly in 1934 by the New York Academy of Medicine and the Library of the University of Munich, which contains the illustrations in all of Vesalius's publications, printed in most cases from the original blocks in the possession of the Library at Munich.

Winter General Hospital, Topeka, Kansas

Distinguished Medical Officers Honored at Winter General Hospital, Topeka, Kansas

Winter General Hospital, Topeka, Kansas, is named for the late Brigadier-General Francis Anderson Winter, who was Surgeon of the Lines of Communication in France early in the First World War and later was our senior medical officer in Great Britain.

This institution has adopted the interesting plan of naming its important clinics, buildings and streets for distinguished deceased medical officers of the Army who so far have never been honored by having their names given to

buildings, general hospitals, or other entities of the Medical Department, U. S. Army. Winter General Hospital is the first of the Army's general hospitals to take this step.

The names are selected as appropriate for the particular clinic or building. The names of the streets are those of medical officers who have become the heads of other branches of the Army. In some instances Army posts have been named for these chiefs of other branches, but there has heretofore been no medical building or institution named for them.

The following are the names of the selected:

1. The Waterhouse Medical Clinic. Named for Surgeon Benjamin Waterhouse (1754-1846) of Massachusetts who introduced vaccination in America; first Professor of Medicine at Harvard.
2. The John Jones Surgical Clinic. Named for Surgeon John Jones (1729-1791) of New York who wrote the first American medical book, founded the New York Hospital; first professor of Surgery at King's College, now Columbia University.
3. The Northington Roentgenological Clinic. Named for Colonel Eugene Garland Northington (1880-1933) of Alabama, pioneer student of military roentgenology; lost both arms and finally his life from malignancy due to exposure to the rays before their danger was known to science.
4. The Rodriguez Dental Clinic. Named for Major Fernando Emilio Rodriguez (1888-1932) of Puerto Rico, who made the first studies of the bacteriology of dental caries.
5. The Keen Neurosurgical Clinic. Named for Major William Williams Keen (1837-1932) of Pennsylvania, pioneer student, with his colleagues, Acting Assistant Surgeons Silas Weir Mitchell and George Reed Moorehouse, of gunshot wounds of nerves; one of the few medical officers who served in both the Civil and World Wars.
6. The Rush Neuropsychiatric Clinic. Named for Surgeon General Benjamin Rush (1745-1813) of Pennsylvania, author of the first American book on insanity, the only systematic American treatise on the subject before 1883; signer of the Declaration of Independence; founder of the University of Pennsylvania.
7. The Shippen Clinic for Women. Named for Director General William Shippen, Jr. (1736-1808) of Pennsylvania, first teacher of obstetrics in America; first professor of surgery in America; founder of the University of Pennsylvania.
8. The Woodward Laboratory. Named for Lieutenant-Colonel Joseph Janvier Woodward (1833-1884) of Pennsylvania, pioneer in photomicrography; eminent anthropologist; President of the American Medical Association.

9. The Fletcher Medical Library. Named for Colonel Robert Fletcher (1823-1912) of the District of Columbia, first Editor of the *Index Medicus*, eminent bibliographer and anthropologist.
10. The William Brown Pharmacy. Named for Physician General William Brown (1748-1792) of Virginia, author of the first American Pharmacopoeia.
11. McGee Hall (Nurses Quarters). Named for Contract Surgeon Anita Newcomb McGee, M. D., R. N., (1864-1940) of the District of Columbia, organizer of the Army Nurse Corps and leader in advancing the profession of nursing in America.
12. Boschen Hall (Enlisted Men's Recreation Building). Named for Major-General Frederick Wegener Boschen (1876-1942) of New York, Hospital Steward who became Chief of Finance of the United States Army.
13. Leonard Wood Road. Named for Major-General Leonard Wood (1860-1927) of New Hampshire, who won the Medal of Honor for extreme gallantry as a medical officer, and who became Chief of Staff of the Army.
14. Ainsworth Road. Named for Major-General Fred Crayton Ainsworth (1852-1943) of Vermont, the medical officer who devised the Army's system of personnel records and who became Adjutant General of the Army.
15. Eustis Road. Named for Surgeon William Eustis (1753-1825) of Massachusetts who served as a medical officer during the Revolution and became Secretary of War in President Jefferson's cabinet; Member of Congress; Governor of Massachusetts.
16. McHenry Road. Named for Surgeon James McHenry (1753-1816) of Pennsylvania who served as a medical officer during the Revolution and became Secretary of War in President Washington's and President Adams' cabinets; Member of Congress; Member of the Convention which framed the Constitution of the United States.
17. Myer Road. Named for Brigadier-General Albert James Myer (1828-1880) of New York, distinguished field surgeon and student of military communication systems; founder of the Signal Corps and first Chief Signal Officer of the Army; father of the Weather Bureau.

University of Chicago

Under the Charles R. Walgreen Foundation of the University of Chicago public lectures are being held by members of the Faculty of the Division of the Biological Sciences during the Spring Quarter, 1943. The general subject of the lectures is *Medicine and the War*. On April 7 Dr. Arno B. Luckhardt discussed the "Historical Background and Introduction."

NEWS FROM LATIN AMERICA

The *Revista Argentina de Historia de la Medicina*, vol. II, no. 1 contains the following main articles:

Juan Ramon Beltran: Curioso trámite de una insania en 1824.
Atilio J. Costa: Chutro, maestro.
Afranio Peixoto: As minhas Faculdades.
Manuel Humberto Villacís: El Hospital San Juan de Dios, de la ciudad de San Francisco, de Quito.
Alejandro von der Becke: La solidaridad intelectual argentino-boliviana.
José María Fiorini: Antecedentes de una rigurosa tramitación para determinada práctica de la odontología en 1834.

NEWS FROM EUROPE

Switzerland

The *Swiss Paracelsus Society* (Schweizerische Paracelsus-Gesellschaft) was founded in Einsiedeln, the birthplace of Paracelsus, on October 11, 1942. The purpose of the Society is "to investigate the activities of Paracelsus and the influence they have exerted on the various fields of science and learning such as philosophy, the natural sciences and medicine." The Society will publish *Nova Acta Paracelsica* and organize lectures. The annual dues will be 5 Swiss francs. The officers of the Society are as follows:

President: Prof. Linus Birchler (Zürich)
Vice-President: Dr. René Jaccard (Geneva)
Treasurer: Ferdinand Birchler (Einsiedeln)
Secretary: Dr. P. Ildefons Betschart (Einsiedeln)
Council Members: Prof. C. G. Jung (Zürich)
Dr. J. Strebel(Lucerne)
Dr. W. Bigler (St. Gall)
Josef Denkinger (Gossau)
Landammann Betschart (Einsiedeln)
Prof. Zangger
Dr. Jolan Jacobi

At the organization meeting Dr. Josef Strebel of Lucerne and Dr. W. Bigler of St. Gall discussed the present status and future tasks of Paracelsian research. Dr. C. G. Jung discussed the concepts of Iliaster and Mercurius in Hermetic Philosophy and in the works of Paracelsus. Archbishop Netzhammer was made an honorary member of the Society and also posthumously the French physician Dr. René Allendy. The meeting was closed with a performance of the Paracelsus play of Max Geilinger.

BOOK REVIEWS

I. Bernard Cohen, *Roemer and the First Determination of the Velocity of Light*. New York: The Burndy Library, Inc. 1942. 63 pp. $.50.

This pamphlet is the first publication of the recently organized Burndy Library which promises to issue from time to time studies and translations in the history of science. Students of medical history will be interested to note among the forthcoming publications the first English translation of Galvani's *De Viribus Electricitatis in Motu Musculari* by I. B. Cohen and Helen L. Thomas; and Harvey Cushing's translation of the anonymous *Dell' Arco Conduttore*. A new edition and translation, by Dr. Edward Rosen, of Copernicus' fundamental treatise is also announced for 1943, the four hundredth anniversary of the original publication.

It is to be hoped that the new organization, which is a non-profit society, will succeed in filling the need for a series of English translations in the history of science comparable to Ostwald's *Klassiker*. In the field of medicine Dr. Emerson Crosby Kelly's much appreciated but unfortunately discontinued *Medical Classics* fulfilled a similar purpose; and at present the Johns Hopkins Institute of the History of Medicine publishes classics of medicine both in this *Bulletin* and in its series *Texts and Documents*.

The present study is substantially a reprint of a paper published in the April 1940 number of *Isis*, of which only a few copies have ever reached the United States. Mr. Cohen recounts the contributions of Ole Roemer (1644-1710) in various fields of science, the main part of the paper being concerned with Roemer's work in determining the velocity of light on the basis of observations of periodic eclipses of the innermost satellite of Jupiter. There is a brief historical sketch of the idea of a finite velocity of light from Empedocles to Roemer. This is followed by an account of the reception of Roemer's work and the debates and discussions it provoked—discussions participated in by such figures as Cassini, Huygens, Flamsteed, Halley, and Newton—until Bradley's work gave independent confirmation to Roemer's ideas about a half-century after they had first been announced in 1676.

The study is an excellent one and shows the same thoroughness and precision that have characterized Mr. Cohen's numerous contributions to the history of science. In the historical sketch of the notation of a finite velocity of light it seems to me that the views of the Epicureans (cf., for instance, Lucretius II. 142 ff., IV. 143 ff.) might well have been included.

I. E. Drabkin

A. Irving Hallowell. *The Role of Conjuring in Salteaux Society.* [Publications of the Philadelphia Anthropological Society, Vol. II] Philadelphia: University of Pennsylvania Press, 1942. ix + 96 pp., 1 fig., 2 plates. $1.25.

Conjuring ceremonies in a shaking tent have been reported for more than 300 years from the Algonkian tribes of the Eastern Woodland area. They have been mentioned frequently in literature on spiritualism and primitive medicine. Mr. Hallowell is one of the few anthropologists who ever actually witnessed these performances (among the Salteaux, an Ojibwa-speaking tribe living on the East side of Lake Winnipeg). He reports here his observations integrated into a short but impressive description of Salteux culture, and checks his data with the earlier literature.

Among the Salteaux only male individuals conjure after having acquired their power of dreams. One conjurer acts but a few times during his life. His fee is small; in spite of his great skill he is not a professional. Conjurers are and apparently were always very numerous among the Salteaux (10 per cent of the male population). This is by no means a general feature among Algonkian conjurers. W. J. Hoffman reported only 5 conjurers in 1500 individuals among the Ojibwa (Rep. VII, Am. Bur. Ethnol., Wash., 1891, p. 158). By his non-professionalism as well as by his technique, the Salteaux conjurer reminds one somewhat of the Siberian family shaman. During the seance the spirits (especially the turtle spirit) and sometimes the ghosts of deceased people sing out of a barrel-shaped, shaking tent in which the conjurer sits. They answer questions concerning hunting, warfare, the health and residence of absent tribesmen and especially the *disease causes of present sufferers* (sorcery or taboo-transgression), provoking confessions in the latter case. During the seance the spirit-aids of the conjurer may also kill the souls of his enemies, wave off the cannibal spirits (windigo), or *bring back the departing souls of dying people.* Conjuring is thus an important medical rite, chiefly "diagnostic." On the other hand, it strengthens the belief of people in the existence of spirits and ghosts, supports the social structure, gives a sense of security to the community in the face of the menace of famine, disease and cannibal spirits. Finally, a seance satisfies artistic needs and purposes. The prophesies of the conjurers are very clever, but do not seem to transgress the limits of mathematical probability. The healing by revealing "complexes"—but those of ancestors—makes one a little bit suspicious of the rationality of certain psychotherapeutic procedures in our society.

Mr. Hallowell's excellent little book contains also a very interesting chapter on the sincerity of conjurers. Mr. Hallowell has given during the last ten years much thought to primitive medicine, especially in connection with mental disease, always using his original material from the Salteaux. Unfortunately all these valuable contributions, which are undoubtedly among the best in our field, are by now widely scattered in different journal articles.

It is to be hoped that Mr. Hallowell will give us in the not too distant future a book which summarizes all his observations and reflexions on Salteaux culture. Such a book will be equally welcome and necessary to the medical historian as well as to the anthropologist.

E. H. ACKERKNECHT

WARREN D. DAWSON. Article on "Medicine" in: *The Legacy of Egypt.* Edited by S. R. K. GLANVILLE. Oxford: Clarendon Press, 1942. Pp. 179-197. $4.00.

It is no easy task to characterize Egyptian medicine and explain its impact on occidental civilization in less than twenty pages. Yet Mr. Dawson has solved this task in a manner both interesting and informative. Indeed, the description of the medical papyri, the illustrative facts adduced and the interpretations offered give such a well rounded picture of Egyptian medicine and its influence that the reader may not be aware of the subjective and somewhat dogmatic presentation. Since Mr. Dawson's article will undoubtedly find readers not conversant with the literature on the subject, a critical discussion of some of his views seems indicated.[1]

The author assumes the existence of a general medical treatise, extracts from which have come down in the Papyrus Ebers, the Edwin Smith Papyrus and the Kahûn Papyrus. These remnants, recognizable by their standard form, he distinguishes as group I, from group II, which is made up of incantations and "medico-magical recipes" (p. 182-183). If by this it is meant that in the early times of ancient Egypt there existed something like a comprehensive work dealing with all branches of medicine, such an assumption would need proof. For it seems that Egyptian medicine started from many specialties dealt with in special treatises such as the Edward Smith Papyrus on injuries, and that a synthesis of specialties into one general medicine marked a development rather than an origin.

By not giving full weight to the chronological individuality of the papyri, Dawson is induced to consider them as equal witnesses of Egyptian medicine as a whole. Thus he can say that the surgical Edwin Smith Papyrus is "only

[1] Cf. Owsei Temkin, Recent publications on Egyptian and Babylonian medicine, *Bulletin of the History of Medicine*, vol. 4, pp. 247-256, March 1936, where the reader will find the literature on which this review is based. Of more recent publications I should like to mention: Hermann Grapow, *Untersuchungen über die altägyptischen medizinischen Papyri* II. Teil. Leipzig, 1936 (Mitteilungen der vorderasiat.-aegypt. Gesellsch. 41. Band, 2. Heft). B. Ebbell, *Alt-ägyptische Bezeichnungen für Krankheiten und Symptome*. Oslo, 1938 (Skrifter utgitt av Det Norske Videnskaps-Akademi I Oslo II. Hist.-Filos. Klasse. 1938. No. 3). B. Ebbell, *Die alt-ägyptische Chirurgie*. Oslo, 1939 (Skrifter utgitt av Det Norske Videnskaps-Akademi I Oslo II. Hist.-Filos. Klasse. 1939. No. 2).

a part of a larger body of texts into which magic enters to no small extent, as it does, indeed, into that very papyrus itself" (p. 193). This procedure helps him to maintain his thesis that Egyptian medicine developed from magic, mainly as an extension of "manual rites" (cf. p. 185). The reader who is told that "there cannot be the slightest doubt that Egyptian medicine had its origin in magic" (p. 191) should know that such doubt exists and that it is based on the attempt to visualize different stages in the development through an historical and philological interpretation of the papyri.

The author upholds the thesis that the embalming of cadavers offered an opportunity for anatomical observations and opened the way to the scientific dissection of human bodies in later times (pp. 187, 197). This thesis has become very doubtful indeed. The religious atmosphere in which embalming was practiced hardly allowed observations of a profane character. Besides, the anatomical knowledge of the ancient Egyptians seems to have been very meager and the fact that dissections were performed by Greek physicians in Alexandria in the 3rd century B. C. can be explained by the general scientific interest in this center of Greek civilization rather than by any dependence on old Egyptian religious rites.

There will be few to doubt that the drug lore of Egypt influenced later Greek and Roman physicians and through their writings has come down to even more recent times. But Dawson goes too far when he says that "the popular medicine of almost every country of Europe and the Near East largely owes its origin to Egypt" (p. 195). It is one thing to find parallels between Egyptian and later medical prescriptions and quite another to prove that such parallels represent definite historical dependencies. Without entering into any details, the general question may be raised whether it is likely that other countries had no popular medicine of their own but had to take their lessons from Egypt. This thesis would only be tenable if one really assumed that civilization originated and spread from Egypt as its only, or at least main, source, a view which few will be ready to accept.

The above remarks are not intended to prove Mr. Dawson wrong. Where we know so little, almost any opinion is by necessity hypothetical. But the reader should be informed that Mr. Dawson's hypotheses by no means represent generally accepted views.

O. Temkin

Iago Galdston. *Behind the Sulfadrugs: A short history of chemotherapy.* With a preface by Perrin H. Long. New York, London: D. Appleton-Century Company, 1943. 174 pp. $2.00.

It is hardly necessary to emphasize how timely it was to write a history of chemotherapy. Dr. Galdston, after giving us a very impressive view of

Paracelsus and Boyle, leads us through the beginnings of organic chemistry, the achievements of Pasteur, Weigert, Lister, Déclat, Koch, von Behring, up to the monumental work of Ehrlich. Then come the "doldrum years"—and then the sulfadrugs. A very thoughtful last chapter ("Stay of execution —not full pardon") shows how sulfadrugs, being only a part of curative medicine, cannot *solve* definitely the problem of disease, a task which is reserved to preventive medicine. Although the story of the great scientists is only used as a "vehicle of the matter" which is "the advance of knowledge and growth of ideas," and because Dr. Galdston never falls into cheap hero worship of the telling of irrelevant anecdotes, his portraits are often of unusual strength, especially in such a difficult case as that of Ehrlich.

The reviewer feels happy that for once there is not much to criticize in a book. That the reviewer looks at the sulfadrugs, which after all make only a part of the story, in a less sanguine way than the author, especially in so far as their external application is concerned, that he sees not only the long list of infectious diseases they cure, but the still longer one they do not influence at all, may after all be more a question of temperament. Besides, the historical approach of the book already works in itself against the loss of proportion. The only shortcoming of the book, and a rather serious one in view of the often very incautious handling of the sulfadrugs by laymen and certain practitioners, is that the considerable toxicity of the sulfadrugs is by no means adequately dealt with.

Although the book is supposed to be a "popular book" one hesitates to label it that way. First because this notion has, after the exertions of certain authors, unfortunately become almost identical with the unscientific and irresponsible. Dr. Galdston, who has already established his reputation as a medical historian, is not only very far from these methods and very correct in his facts, but in giving credit to his sources he also renounces the cheap effects of "originality" of many "popular" books. Furthermore, the forthcoming of a broad and original vision and a lively style—in spite of the tragic misunderstanding of certain scholars that boredom and exclusive detail study are the very stamina of scientific writing—should really not entitle one to call a book popular rather than scientific. The book seems to me only "popular" in the sense that it relates, of course, a good many facts which scientists are supposed to know, and presents things in an easily accessible way without insisting on technicalities. But that probably should be, after all, the only differences between "popular" and "scientific" books. Popular or not, Dr. Galdston's book is in any case a very delightful, fascinating and valuable book and one only regrets that it is not of greater length.

E. H. Ackerknecht

[PHILIP REICHERT] *The Reichert Collection* illustrative of the evolution and development of diagnostic instruments and techniques in medicine. New York: Wellcome Exhibition Galleries, 1942. 70 pp., 11 plates.

This catalogue of the splendid collection of Dr. Philip Reichert which is now on a loan exhibit in the Wellcome Galleries in New York is a valuable contribution to a little cultivated field of medical history. It lists and describes briefly: 8 sphygmographs from Marey (1857) to Mackenzie (1920); 30 sphygmomanometers from Block (1880) to Recklinghausen and Bauman; 4 oscillometers and 4 sphygmoscopes; 15 more recent models of stethoscopes; 17 microscopes constructed since 1850; 16 otoscopes and ophthalmoscopes. It is to be hoped that this little catalogue will stimulate further research in a field of medical history which seems particularly prone to be helpful in the solution of present medical problems.

E. H. ACKERKNECHT